

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Inquiry Concerning Deployment of Advanced	)	GN Docket No. 19-285
Telecommunications Capabilities to All	)	
Americans in a Reasonable and Timely	)	
Fashion	)	

**COMMENTS OF  
USTELECOM – THE BROADBAND ASSOCIATION**

USTelecom — The Broadband Association (USTelecom)<sup>1</sup> submits these comments in response to the Federal Communications Commission’s (Commission or FCC) Notice of Inquiry (Notice) to affirm that advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion.<sup>2</sup>

**I. INTRODUCTION AND SUMMARY**

As a result of significant and sustained industry investment supported by smart policies promoting competition and removing barriers to investment, broadband is available to more Americans than ever before at increasingly higher speeds, including areas that were previously shut off from the promise of broadband. In addition, the gap in availability between urban and rural consumers continues to shrink. As summarized below, the numbers paint a clear picture of

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<sup>1</sup> USTelecom is the premier trade association representing service providers and suppliers for the telecom industry. Its diverse member base ranges from large publicly traded communications corporations to small companies and cooperatives – all providing advanced communications service to both urban and rural markets.

<sup>2</sup> *Inquiry Concerning Deployment of Advance Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, WC Docket No. 19-285, Fifteenth Broadband Deployment Notice of Inquiry, FCC 19-102 (Oct. 23, 2019) (“*2019 NOI*”) (USTelecom refers to “advanced telecommunications capability” and “broadband” interchangeably herein).

ongoing progress making clear that the Commission is successfully meeting its statutory mandate to encourage the deployment of advanced telecommunications services on a reasonable and timely basis to all Americans.<sup>3</sup>

On behalf of our members who offer broadband in every corner of the country, USTelecom commends the Commission for its efforts to close the digital divide and encourage broadband deployment to all Americans. Consistent with our prior comments in response to this annual inquiry,<sup>4</sup> we reiterate our strong support for policies that promote continued broadband deployment by removing barriers to infrastructure investment and providing funding to ensure connectivity in the most remote, high-cost areas of the country.

USTelecom supports the Commission's proposal to continue using a holistic, progress-based approach rather than a single snapshot in time. Measuring sustained progress at multiple speed tiers is an appropriate approach to ensure that progress in deployment is occurring. We also support continuing to use the 25/3 megabit per second (Mbps) benchmark as a goal for fixed broadband service while evaluating multiple speed tiers over a five-year period.

While the Commission should move forward as quickly as possible to establish the Digital Opportunity Data Collection (DODC), and ultimately sunset the current Form 477 data collection for broadband deployment,<sup>5</sup> Form 477 data remain the most comprehensive data on broadband deployment and best tool available to the Commission at this time. These data are particularly helpful for answering the question that this inquiry seeks to answer. While the

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<sup>3</sup> 47 U.S.C. § 1302(a).

<sup>4</sup> Comments of the United States Telecom Association, GN Docket No. 18-238 (Aug. 17, 2018); Comments of the United States Telecom Association, GN Docket No. 17-199 (Sept. 21, 2017).

<sup>5</sup> Joint Comments of the United States Telecom Association, ITTA, and the Wireless Internet Service Providers Association, WC Docket No. 19-195; WC Docket 11-10 (Aug. 17, 2018) (Joint 2019 Digital Opportunity Data Collection Comments) at 14.

Commission finalizes a better data reporting process via the DODC it should not make any significant changes to the current Form 477 process.

Despite substantial progress, some Americans continue to remain on the wrong side of the digital divide. Going forward, the Commission should continue to advance policies that incentivize private investment in modern communications platforms and to provide direct support in high-cost areas via the Connect America Fund and the upcoming Rural Digital Opportunity Fund. In short, USTelecom agrees with the Commission's proposal to maintain the existing framework for evaluating broadband deployment, a framework that supports a continued finding that broadband is being deployed to all Americans in a reasonable and timely fashion.

## **II. SIGNIFICANT PROGRESS IN BROADBAND INVESTMENT AND AVAILABILITY SUPPORT A FINDING OF REASONABLE AND TIMELY DEPLOYMENT**

The Commission correctly concluded in the *2019 Broadband Deployment Report* that advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion. USTelecom commends the Commission for the many steps it has taken to facilitate further broadband deployment by continuing to reduce regulatory barriers to infrastructure deployment and directing support to networks in rural high-cost areas. The combination of industry investment and government support continues to narrow the digital divide substantially, ensuring that more Americans than ever have access to high-speed broadband at all speeds. The most current data demonstrate significant ongoing progress over the last five years, and since the last report, and therefore support a continued finding of reasonable and timely deployment. For the full details of USTelecom's analysis of broadband deployment as of mid-2018, see the full USTelecom November 2019 Broadband Availability

Research Brief attached as an Appendix to these comments.

The underlying foundation of fixed broadband infrastructure is widely deployed in the U.S. – as of mid-2018 97 percent of households had at least one wired broadband option at any speed, 99 percent if fixed wireless is included, and nearly the entire country if satellite is included.<sup>6</sup> U.S. broadband companies must continually invest to upgrade and expand networks. These companies invested approximately \$80.0 billion in network infrastructure in 2018, compared to \$76.9 billion in 2017 and 74.8 billion in 2016.<sup>7</sup> This is an increase of \$3.1 billion in the last year alone and approximately \$5.1 billion greater in 2018 than 2016.<sup>8</sup>

Due to continual provider investments in network upgrades, broadband at higher speeds is now widely available and has grown significantly over time. As of mid-2018 wired broadband service at 10 Mbps download and 1 Mbps upload (10/1) was available to 95 percent of Americans – 97 percent, if terrestrial fixed wireless is included. Wired broadband service at 25/3 Mbps was available to 92 percent of Americans – 94 percent, if terrestrial fixed wireless is included; and wired broadband service at 100/10 Mbps was available to 89 percent of Americans – 90 percent, if terrestrial fixed wireless is included.<sup>9</sup>

Consistent with the FCC’s five-year timeframe for evaluating deployment, USTelecom here compares the most current data from mid-2018 to mid-2014 data from the National

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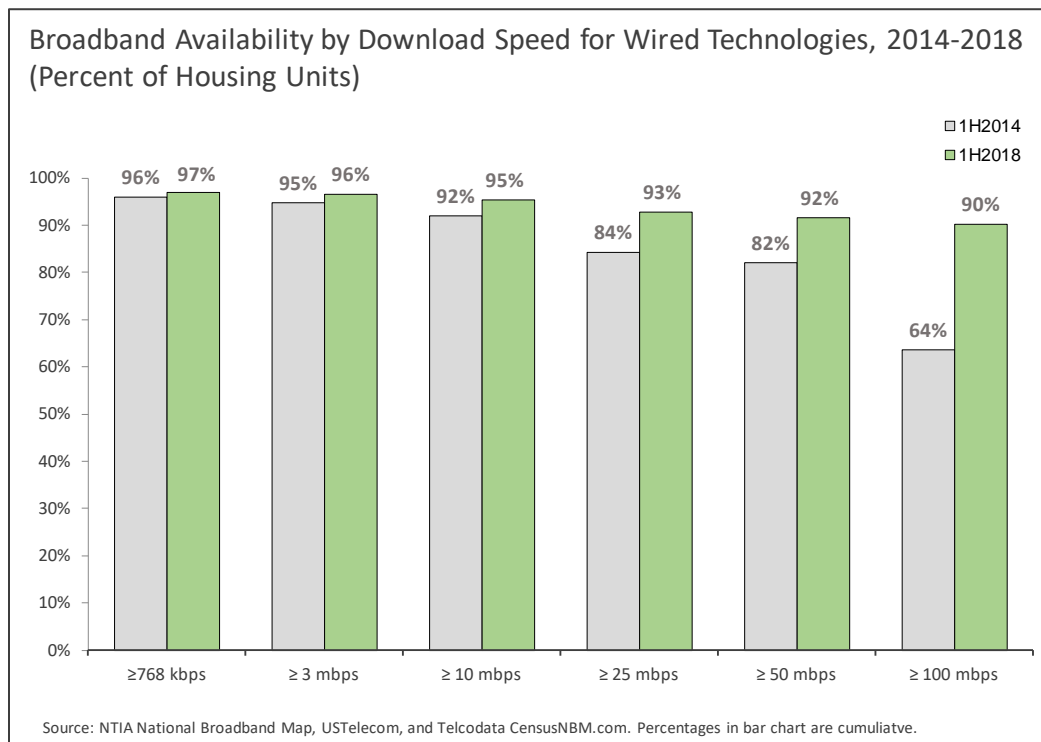
<sup>6</sup> Patrick Brogan, USTelecom Research Brief, *U.S. Broadband Availability Mid-Year 2018*, (Nov. 14, 2019), available at <https://www.ustelecom.org/wp-content/uploads/2019/11/USTelecom-Research-Brief-2018-Mid-Year-Broadband-Availability.pdf>.

<sup>7</sup> Patrick Brogan, USTelecom, *U.S. Broadband Investment Continued Upswing in 2018* (July 31, 2019) (“USTelecom July 2019 Broadband Capex Research”) at 1, available at <https://www.ustelecom.org/wp-content/uploads/2019/07/USTelecom-Research-Brief-Capex-2018-7-31-19.pdf> (The figures cited include wireless, wireless, and cable broadband providers).

<sup>8</sup> USTelecom November 2019 Broadband Availability Research Brief at 1.

<sup>9</sup> *Id.* at 4-5.

Telecommunications and Information Administration (NTIA).<sup>10</sup> Broadband availability has grown across all speed tiers. For example, from 2014 to 2018, wired broadband at 10 Mbps download grew from 92 percent to 95 percent; wired broadband at 25 Mbps download grew from 84 percent to 93 percent; wired broadband at 50 Mbps download grew from 82 percent to 92 percent; and wired broadband at 100 Mbps download grew from 64 percent to 90 percent.<sup>11</sup> See chart.



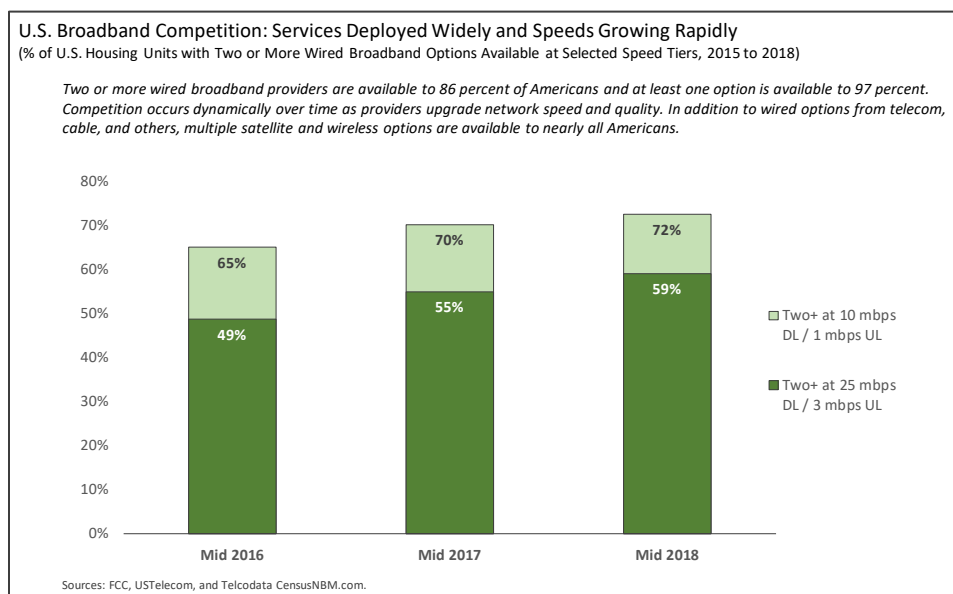
Even in just the last year, there has been meaningful progress. From mid-2017 to mid-2018, fixed broadband availability at 10/1 Mbps grew from 96 percent to 97 percent. Fixed

<sup>10</sup> NTIA, National Broadband Map, Broadband Statistics Report: Access to Broadband Technology by Speed (Mar. 2015) (The NTIA data are for wired (“wireline”) broadband and include download speeds only).

<sup>11</sup> *Id.* at 3-4 (for 2018 data). For comparison to mid-2018 data, See USTelecom November 2019 Broadband Availability Research Brief at 6. (Only download data for wired broadband are available from the NTIA data for 2013 for comparison with current FCC figures).

broadband availability at 25/3 Mbps grew from 92 percent to 94 percent. Fixed broadband availability at 50/5 Mbps grew from 91 percent to 92 percent. Fixed broadband availability at 100/10 Mbps grew from 83 percent to 90 percent.<sup>12</sup>

Competition at all of these speeds is healthy and growing. There were at least two providers of basic wired broadband infrastructure at any speed available to 86 percent of U.S. households as of the mid-2018 – 91 percent, if fixed wireless is included.<sup>13</sup> The portion of U.S. households with two or more wired broadband providers available at 10/1 Mbps upload was 72 percent in 2018. This was up from 65 percent in mid-2016 and 70 percent in mid-2017.<sup>14</sup> The portion of U.S. households with two or more wired broadband providers available at 25/3 Mbps was 59 percent in mid-2018, up from 49 percent in mid-2016 and 55 percent in mid-2017.<sup>15</sup>



<sup>12</sup> *Id.* at 4-5. For comparison to mid-2017 data, *See* Patrick Brogan, USTelecom, U.S. Broadband Availability Mid-Year 2017 (Nov. 20, 2018) at 8 and Appendix A, *available at* <https://www.ustelecom.org/wp-content/uploads/2018/12/US-BB-Availability-2017-1H-.pdf> (visited Nov. 12, 2019).

<sup>13</sup> USTelecom November 2019 Broadband Availability Research Brief at 2.

<sup>14</sup> *Id.* at 11; *See* Chart 9.

<sup>15</sup> *Id.*

In recent years, wireline providers and competitive cable, fiber, and fixed wireless broadband providers have begun to deploy consumer services at cutting-edge speeds up to a gigabit or near a gigabit, speeds that were practically unheard of for consumers only several years ago. As of mid-2018, fixed broadband at 1 Gigabit per second (Gbps) or greater download speed was available to 26 percent of Americans. Fixed broadband measured at 940 Mbps or greater download speed was available to 67 percent of Americans.<sup>16</sup> Such cutting-edge services were effectively unavailable to most consumers in 2013.

While competition effectively drives network upgrades and expansion in much of the U.S., there remain areas, primarily very high-cost rural and tribal areas, where the economics may be less favorable to deployment. However, Commission actions to close rural broadband gaps are having an impact. Since the end of 2015, the gap between non-rural and rural deployment at 10/1 Mbps has dropped from 21 percentage points to 10 percentage points. That figure has dropped by nearly four percentage points from 2017 to 2018. At 25/3 Mbps, the gap between non-rural and rural deployment has narrowed since the end of 2016 from 37 percentage points to 24 percentage points, including almost a five percentage point drop from 2017 to 2018.<sup>17</sup>

In addition to fixed broadband, nearly all Americans have access to broadband service via mobile wireless, with 99.8 percent able to get mobile broadband via fourth generation (4G)

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<sup>16</sup> *Id.* at 4-6. (In the FCC’s broadband deployment data, companies typically report cutting-edge services at speeds of 940 Mbps or greater. Therefore, this is a more relevant measure of deployment of such services than a literal 1 Gbps measurement. According to the cable industry, “gigabit” services were available to nearly 80 percent of Americans by the end of 2018); *See, e.g., Cable Labs, Driving Gigabit Speeds from Lab to Consumer*, available at <https://www.cablelabs.com/gigabit-internet-speeds/> (visited Nov. 12, 2019).

<sup>17</sup> USTelecom November 2019 Broadband Availability Research Brief at 2-3. (USTelecom measures the gap as the difference in percentage of household in non-rural and rural areas with broadband available at selected speed tiers).

LTE (Long Term Evolution) technology as of mid-2018.<sup>18</sup> A choice of mobile LTE broadband from three or more providers was available to 98 percent of Americans as of mid-2018.<sup>19</sup> In the meantime, providers today are deploying fifth generation (5G) wireless services over fixed and mobile networks. 5G wireless technology promises blazing fast, low latency broadband connectivity enabling new applications and potentially offering alternatives to wired broadband.

The foregoing data and analysis demonstrate that broadband deployment progress continues to occur at a breakneck pace. There are ample market incentives for providers to deploy better and faster broadband in most of the country, and where the economics of rural deployment present challenges, Commission actions have done much to close rural broadband gaps. These facts support a finding that deployment of advanced telecommunications capability continues to be reasonable and timely.

### **III. THE COMMISSION SHOULD MAINTAIN ITS EXISTING FRAMEWORK FOR MEASURING THE STATE OF BROADBAND DEPLOYMENT**

In line with the 2018 and 2019 *Broadband Deployment Reports*,<sup>20</sup> the Commission proposes to take a holistic review of progress in the deployment of advanced telecommunications capability, considering a range of speeds provided over both fixed and mobile technologies rather than only considering a single benchmark speed. The Commission also proposes to continue evaluating progress over a five-year period. USTelecom agrees with

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<sup>18</sup> *Id.* at 2.

<sup>19</sup> *Id.* at 2, 7.

<sup>20</sup> *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 17-199, 2018 Broadband Deployment Report, FCC 18-10 (Feb. 2, 2018) (“2018 Report”); *Inquiry Concerning deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, GN Docket No. 19-285, 2019 Broadband Deployment Report, FCC 19-44 (May 29, 2019) (“2019 Report”).



the Commission’s proposal to continue to apply this holistic, progress-based approach.<sup>21</sup>

**A. THE COMMISSION SHOULD CONTINUE TO USE A HOLISTIC APPROACH, INCLUDING A SEPARATE ANALYSIS OF FIXED AND MOBILE SERVICES**

In its *2019 Report*, the Commission evaluated the availability of fixed and mobile services over a five-year period (2013-2017) using the same four categories in its *2018 Report*.<sup>22</sup> The four categories included: (1) those with fixed services available; (2) those with mobile LTE services available; (3) those with both fixed terrestrial *and* mobile LTE services available; and (4) those with at least one of either fixed terrestrial *or* mobile LTE services available.<sup>23</sup>

USTelecom supports the Commission’s proposal to incorporate both fixed and mobile services into the current Section 706 inquiry. While the Commission has found that mobile broadband services are not “currently full substitutes for fixed service,”<sup>24</sup> some customers depend on mobile broadband only and many applications are serviceable over both fixed and mobile networks.<sup>25</sup> Therefore, it remains vital for the Commission to monitor changing market developments, especially as new alternatives like 5G fixed and mobile wireless broadband

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<sup>21</sup> See *2019 NOI*, para. 6.

<sup>22</sup> *2019 Report*, para. 27-29; *2018 Report*, paras. 44-46.

<sup>23</sup> *2019 Report*, para 8.

<sup>24</sup> *2019 Report*, para. 11; *2018 Report*, para. 18.

<sup>25</sup> See, e.g., Pew Research Center, *Mobile Technology and Home Broadband 2019* (June 13, 2019), available at <https://www.pewresearch.org/internet/2019/06/13/mobile-technology-and-home-broadband-2019/> (“Today, 37 [percent] of U.S. adults say they mostly use a smartphone when accessing the internet. This share has nearly doubled since 2013.” “Some 17% of U.S. adults are ‘smartphone-only internet users’ – meaning they report owning a smartphone but do not have a traditional high-speed internet connection where they live. This share has roughly doubled since 2013, when 8% of adults fell into this category.” “Among non-broadband users, 45% say they do not have broadband at home because their smartphone lets them do everything they need to do online, up from 27% in 2015. See also, The Internet Innovation Alliance, *Consumer Preferences for Internet Access and Online Activities Market Research Report* (June 27, 2018), available at [https://internetinnovation.org/wp-content/uploads/Civic-Sciences-2018-Report\\_Final.pdf](https://internetinnovation.org/wp-content/uploads/Civic-Sciences-2018-Report_Final.pdf) (“Approximately 6% of consumers report that they have already switched to mobile-only Internet access, or that they are considering switching.”).

become more widely available.

**B. THE COMMISSION SHOULD CONTINUE TO UTILIZE THE 25/3 MBPS BENCHMARK AS ITS GOAL FOR FIXED SERVICE AND CONTINUE TO EVALUATE THE FIVE SPEED TIERS OVER A FIVE YEAR PERIOD**

USTelecom agrees that the current speed benchmark of 25/3 Mbps is the appropriate measure to assess whether fixed services provide advanced telecommunications capability.<sup>26</sup> This approach is consistent with the Commission’s current vision for reasonably comparable broadband service in rural areas through the Connect America Fund and the proposed Rural Digital Opportunity Fund.<sup>27</sup> It is also consistent with consumer purchasing patterns even when they have access to greater speeds.

Although emerging technologies may eventually require even more bandwidth in coming years, there is no reason to move away from the 25/3 Mbps as the target benchmark today. As a practical matter, the most data intensive services used today are online video services. Current streaming services compress their streams in efficient ways such that current usage patterns typically do not require more bandwidth than 25/3 Mbps.<sup>28</sup> The most commonly suggested next step up for a target benchmark is 100 Mbps download.<sup>29</sup> Yet, the most current FCC broadband subscriber data indicate that nearly a third of residential broadband subscribers

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<sup>26</sup> 2019 Report, paras. 12-14; 2018 Report, para. 21.

<sup>27</sup> *Rural Digital Opportunity Fund*, WC Docket No. 19-126, WC Docket No. 10-90, Notice of Proposed Rulemaking, FCC 19-77 (Aug. 2, 2019) (“*Rural Digital Opportunity Fund NPRM*”) (proposing 25/3 as the baseline speed for participation).

<sup>28</sup> Shalini Ramachandran *et al.*, The Wall Street Journal, *The Truth About Faster Internet: It’s Not Worth It* (Aug. 20, 2019), available at <https://www.wsj.com/graphics/faster-internet-not-worth-it/> (visited Nov. 15, 2019) (stating “People who paid for even faster speeds still streamed video at about the same speeds as everyone else, resulting in their using a smaller portion of available bandwidth”).

<sup>29</sup> See, e.g., *Fifteenth Broadband Deployment Notice of Inquiry*, Statement of Commissioner Jessica Rosenworcel. The download threshold likely would be paired with some upload speed, such as 10 Mbps.

choose to purchase internet access service with download speeds less than 25 Mbps.<sup>30</sup> Nearly another third purchase services between 25 Mbps and 100 Mbps.<sup>31</sup> As discussed in Section II, fixed broadband at 25 Mbps or greater is available to at least 94 percent of Americans and fixed broadband at 100 Mbps or greater is available to approximately 90 percent of Americans.<sup>32</sup> In all, more than 60 percent Americans purchase service below 100 Mbps and almost half of those purchase service lower than the current 25 Mbps benchmark – all of this despite greater than 90 percent availability of service at both of those speed thresholds.<sup>33</sup> Most consumers do not purchase service at speeds at or above 100 Mbps because it is not necessary to support commonly used applications, including data-intensive streaming services. Given that broadband service based on the Commission’s current benchmark provides ample capacity to support typical usage and meets the demands of a significant majority of consumers, despite wide availability of higher speed services, it is premature to raise the target benchmark.

Nonetheless, to ensure a holistic view of deployment, USTelecom supports the Commission’s approach of measuring broadband deployment at multiple speed tiers over a multi-year period: 10 Mbps/1 Mbps, 25Mbps/3 Mbps, 50 Mbps/5 Mbps, 100 Mbps/10 Mbps, and 250 Mbps/25 Mbps. Should the Commission at some point in the future wish to consider evaluating cutting-edge speed tiers, such as such as services up to 1 Gbps, USTelecom recommends measuring such services at 940 Mbps or greater, rather than 1 Gbps or greater. As

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<sup>30</sup> Federal Communications Commission Industry Analysis Division Office of Economics & Analytics, *Internet Access Services: Status as of December 31, 2017* at 15, See Figure 10 (Aug. 2019) (“*FCC December 2017 Internet Access Report*”).

<sup>31</sup> *Id.*, at 15.

<sup>32</sup> USTelecom November 2019 Broadband Availability Research Brief at 5-6.

<sup>33</sup> *FCC December 2017 Internet Access Report* at 15. The more than 60 percent of American purchasing service below 100 Mbps consists of 29.0 percent below 25 Mbps plus 31.6 percent between 25 Mbps and 100 Mbps.

discussed in Section II, a 940 Mbps threshold is more relevant because it more accurately captures what providers report to the Commission. USTelecom also supports the Commission's proposal to evaluate progress over five-years as a reasonable period rather than a single point in time. Reasonable deployment does not occur instantaneously and requires the appropriate amount of investment in order to serve significant portions of the country. Moreover, establishing five-year benchmarks for advanced telecommunications capability is a helpful way for the Commission to chart progress in deployment to see how deployment is changing.

**C. THE COMMISSION SHOULD CONTINUE USING THE FCC FORM 477 DATA TO EVALUATE DEPLOYMENT OF FIXED BROADBAND SERVICE UNTIL MORE COMPREHENSIVE DATA IS AN OPTION**

In its *2019 NOI*, the Commission acknowledged that, despite its noted limitations,<sup>34</sup> the Form 477 deployment data for fixed technologies are the most reliable and comprehensive dataset to assess availability of fixed services. USTelecom agrees with the Commission that Form 477 deployment data for fixed technologies is currently the most reliable and comprehensive dataset with which to assess availability of fixed services.<sup>35</sup> In addition, it remains well suited for the purpose of assessing broadband deployment at a high-level (as opposed to specific locations), which was the original, intended purpose of the National Broadband Map, from which Form 477 reporting evolved.<sup>36</sup>

While some, including USTelecom, have criticized the FCC Form 477 data for overstating deployment, we have consistently emphasized that this is a challenge in large census blocks in low-density rural areas, an issue particularly relevant in the universal service

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<sup>34</sup> *2019 NOI*, para. 16.

<sup>35</sup> *2019 Report*, para. 25. *See also 2018 Report* at 1677, para. 43.

<sup>36</sup> *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10, Report and Order, FCC 13-87 (Jun. 27, 2013).

context. The overstatement of coverage in Form 477 data is directly related to a known, and quantifiable error in assumptions. Specifically, the methodology assumes that all locations in a census block can receive service from a provider if one location is receiving such service.

While this assumption is nearly always correct in urban areas, where census blocks are quite small (often no larger than a city block), it becomes progressively less true in low-density, rural areas where census blocks can be as large as an entire county in the extreme case.

Consequently, the shortcomings of Form 477 data are minimal in smaller, more densely populated geographic areas where multiple providers are offering broadband service using a variety of technologies. Moreover, the degree of overstatement in rural areas can be estimated and corrected, as USTelecom has demonstrated through its Broadband Mapping Pilot.<sup>37</sup> At large levels of aggregation, the degree of overstatement minimally impacts the broader conclusions and trends described in USTelecom's national analysis.<sup>38</sup>

At the same time, USTelecom applauds the Commission for acknowledging the weak points in Form 477 data and striving for improvement.<sup>39</sup> The Commission should move quickly to establish the Broadband Serviceable Location Fabric (Fabric), and integrate it into the DODC

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<sup>37</sup> Letter from Jonathan Spalter, President & CEO of USTelecom – The Broadband Association *et al.* to Marlene H. Dortch, Secretary, FCC (Aug. 20, 2019) (“Re: Establishing the Digital Opportunity Data Collection, WC Docket No. 19-195; Modernizing the FCC Form 477 Data Program, WC Docket No. 11-10; Connect America Fund, WC Docket No. 10-90; Rural Digital Opportunity Fund, WC Docket No. 19-126”), available at <https://www.ustelecom.org/wp-content/uploads/2019/11/USTelecom-Research-Brief-2018-Mid-Year-Broadband-Availability.pdf> (USTelecom submitting to the Commission a report summarizing the key findings and methodology from USTelecom's Broadband Mapping Proof of Concept Pilot).

<sup>38</sup> Patrick Brogan, USTelecom Research Brief, *U.S. Broadband Availability Mid-Year 2018*, (Nov. 14, 2019), available at <https://www.ustelecom.org/wp-content/uploads/2019/11/USTelecom-Research-Brief-2018-Mid-Year-Broadband-Availability.pdf>.

<sup>39</sup> *Digital Opportunity Data Collection (“DODC Order”)*, WC Docket No. 19-195, Report and Order and Second Further Notice of Proposed Rulemaking, FCC 19-79 (Aug. 6, 2019); *Modernizing the FCC Form 477 Data Program*, WC Docket No. 11-10, Report and Order and Second Further Notice of Proposed Rulemaking, FCC 19-79 (Aug. 6, 2019) para. 5.

as proposed by the Commission and then require fixed and mobile providers to report availability on top of the Fabric.<sup>40</sup> The Fabric can serve as the uniform foundation for more accurate reporting of broadband availability and can enhance our ability to understand the unserved areas of the country. It will improve the accuracy and granularity of broadband availability reporting, particularly in rural areas where the lack of granularity presents challenges for policymaking decisions.

Finally, while it is appropriate for the Commission to acknowledge the weaknesses of the Form 477 deployment date in certain policymaking contexts (*e.g.*, universal service location-based deployment obligations in rural unserved areas), the Commission should continue to use the Form 477 data collection process until the DODC transition, including the Fabric, is complete as it is the most comprehensive, reliable data set available. Importantly, Form 477 data also covers deployment consistently over many years, which allows for comparison and evaluation of progress over a multi-year period, which is another component of the analysis in this docket.

#### **IV. THE COMMISSION SHOULD CONTINUE TO PROMOTE BROADBAND DEPLOYMENT THOROUGH SMART POLICIES THAT INCENTIVIZE INVESTMENT AND INNOVATION**

The Commission has appropriately focused its agenda on policies that remove barriers to deployment and provide incentives for investment in next generation broadband networks. The increased availability of broadband at all speeds from multiple competitors and the significant increase in broadband capex investment summarized above is based in large part on smart FCC policy. Numerous decisions, grounded in the law and the facts, have paved the way

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<sup>40</sup> Joint Reply Comments of the United States Telecom Association, ITTA, and the Wireless Internet Service Providers Association, WC Docket No. 19-195; WC Docket 11-10 (Oct. 7, 2019) at 1-2.

for this progress, including the return to a light-touch framework governing broadband internet access service, reform of outdated pole attachment rules, infrastructure siting reform, deregulation of the broadband data services market, streamlining the ability to retire legacy infrastructure and discontinue outdated services (while maintaining appropriate consumer protections), and forbearing from many outdated and burdensome regulations that are no longer justified in the modern ultra-competitive communications marketplace, to name just a few.

In addition to these deregulatory steps, the Commission has remained laser-focused on ensuring that its universal service programs continue to target support to homes, businesses, schools, libraries and healthcare providers that depend on the Commission's universal service programs. Millions of American consumers, students, and patients have access to broadband service today that would not be possible without the Commission's continued leadership. USTelecom and its members are proud supporters of all of the Commission's universal service programs.

Going forward, the Commission should stay the course in its efforts to promote network modernization through the elimination of outdated regulations and to continue to directly support infrastructure investment via its four universal service programs. The Commission should continue to closely examine any and all outdated and burdensome rules applicable only to incumbent local exchange carriers (ILECs). FCC policies must account for the fact that there is widespread competition in the voice and broadband markets and that rules applicable to ILECs based on the role they played in the marketplace at the end of the last century are no longer justified. In particular, consistent with its proposals in the draft *Modernizing Unbundling and Resale Rules Notice of Proposed Rulemaking*,<sup>41</sup> the Commission should

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<sup>41</sup> *Modernizing Unbundling and Resale Rules in an Era of Next-Generation Networks and Services*, WC

remove obligations requiring incumbent carriers to open their networks to competitors at rates substantially below market rates almost 25 years after the 1996 Act. It is no longer appropriate to enforce a regime that harms consumers by slowing the transition to modern networks and distorts competition by imposing regulatory burdens on incumbent providers that hold a small and shrinking share of the market. Additionally, the Commission should explore additional reforms to accelerate access to poles<sup>42</sup> and access to government right of ways<sup>43</sup> for fixed broadband deployment, among other things.

The Commission is on the cusp of launching a ten-year \$20.4 billion Rural Digital Opportunity Fund, a program that holds great promise for connecting the remaining Americans who lack access to broadband. The Commission should move forward with a focus on several key principles to ensure a successful program. Specifically, the Commission should (1) invest today in terrestrial broadband to provide a foundation for the future of rural connectivity (both wired and wireless), (2) clearly define transition roles and responsibilities at the program's outset, (3) use lessons learned from the CAF Phase II Auction to ensure reasonable accountability, while also ensuring the program is not bogged down with unnecessary requirements, and (4) reduce the risk of known inaccurate location data for a program grounded in location-based deployment obligations.<sup>44</sup> In conjunction with this effort, the Commission

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Docket No. 19-308, Public Draft Notice of Proposed Rulemaking (Oct. 29, 2019), *available at* <https://docs.fcc.gov/public/attachments/DOC-360518A1.pdf>.

<sup>42</sup> *See e.g.* Comments of CenturyLink, WC Docket No. 19-126; WC Docket No. 10-90 (Sept. 20, 2019) (stating “Reasonable and timely access to poles remains critical to rural broadband and 5G deployment” and “municipal and cooperative utilities frequently fail to provide reasonable and timely access to their poles”) at 23.

<sup>43</sup> *See e.g.* Letter from Thomas Jones, Counsel for Zayo Group, LLC *et al.* to Marlene H. Dortch, Secretary, FCC at 1, 3 (Oct. 31, 2019) (“Re: Accelerating wireless broadband deployment by removing barriers to infrastructure investment, WT Docket No. 17-79; Accelerating Wireline Broadband Deployment by removing barriers to infrastructure investment, WC Docket No. 17-84”).

<sup>44</sup> USTelecom, Rural Development Opportunity Fund (RDOF) Action Center, *available at*



should move quickly to establish the Broadband Serviceable Location Fabric as a core element of its Digital Opportunity Data Collection as described above.<sup>45</sup> The Commission will not be able to truly target support to all those in need without a comprehensive map and dataset of all unserved locations.

## **V. CONCLUSION**

USTelecom supports the Commission's proposal to continue to apply a holistic, progress-based approach to evaluating the deployment of broadband. The most current data demonstrate sustained and significant progress and support a finding that broadband deployment continues to be "reasonable and timely." USTelecom applauds the Commission's efforts to date to eliminate barriers to broadband investment and to jumpstart broadband deployment where the economics of deployment are less favorable – they are working, with investment and deployment steadily rising and rural broadband gaps closing. Yet, there is much work to be done before we have fully bridged the digital divide. USTelecom members stand ready to work with the Commission to continue advancing broadband deployment across the United States.

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<https://www.ustelecom.org/rural-digital-opportunity-fund-action-center> (visited Nov. 21, 2019).

<sup>45</sup> See *Supra* Section III.C.

Respectfully submitted,

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# Appendix

*USTelecom Research Brief*  
*November 14, 2019*

## U.S. BROADBAND AVAILABILITY MID-YEAR 2018

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USTELECOM

THE BROADBAND ASSOCIATION

[USTelecom.org](http://USTelecom.org)

## Summary

USTelecom and CensusNBM analysis of the latest semi-annual broadband availability data from the Federal Communications Commission (FCC), for mid-year 2018, show ongoing progress in broadband deployment in an increasingly competitive marketplace. USTelecom has tracked broadband deployment data since 2010 when the National Telecommunications and Information Administration (NTIA) released its first national broadband map. Responsibility for broadband deployment data shifted from NTIA to the FCC starting with mid-year 2014 data. USTelecom, with CensusNBM, has issued Research Briefs semi-annually with detailed analysis since the FCC release of mid-year 2016 data. The charts and tables below update and supplement data in USTelecom's July 31, 2019 USTelecom Research Brief, "U.S. Broadband Availability Year-End 2017" ([July 2019 Broadband Availability Research Brief](#)).

Below are highlights, followed by a series of charts. Detailed tables are in Appendices A and B. The charts and tables update year-end 2017 data from the July 2019 Deployment Research Brief. The data show that, through capital investments that amounted to \$80 billion in 2018 and totaled more than \$1.7 trillion since 1996, broadband providers continue to deploy more and faster broadband to American consumers and businesses across the nation. They also show rural broadband gaps continuing to decline. While progress is strong in all speed categories, the need to upgrade networks is constant and significant challenges remain in closing rural broadband gaps. Therefore, it is imperative for policymakers to maintain an investment-friendly environment for broadband deployment.

In contrast to previous USTelecom broadband availability research, this Research Brief emphasizes charts and data rather than text analysis. The analysis addresses "wired" broadband (cable, fiber, DSL, other copper), "fixed" broadband (wired plus fixed wireless, excluding mobile and satellite broadband), and various technology subcategories described in Appendix C. USTelecom no longer reports several lower speed tiers that it included in previous Broadband Availability Research Briefs, but which have become less relevant, including 768 mbps and 6 mbps, and any corresponding upload speeds.

In addition to updating previously published data, the charts and tables include new data and analysis not released in previous USTelecom Deployment Research Briefs.

- 940 Megabit per second (mbps) download speed tier. USTelecom provides analysis of broadband availability at different speed tiers. The highest tier we previously analyzed was 1 Gigabit per second (gbps) or greater download. (As the [FCC recognized](#) in its Connect America Fund performance metrics docket, data overhead and equipment limitations may affect the ultimate download speeds customers receive.) Companies typically report cutting-edge broadband services at 940 mbps or greater download speeds. Therefore, USTelecom has added a 940 mbps or greater download speed category to its analysis. Data below are limited to the most current period, mid-year 2018.
- Competitive availability analysis at higher speeds tiers. In past research, USTelecom has provided current and historical analysis of competitive availability at different speed tiers. Previously, USTelecom's competitive availability analysis included service at 25 mbps down / 3 mbps up; 10 mbps down / 1 mbps up; and at any speed. With this release, USTelecom provides analysis of competitive availability 1 gbps download, 940 mbps download, and 100 mbps down / 10 mbps up. The competitive availability data for these latter three speed tiers below are limited to the most current data for mid-year 2018.

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### Highlights as of Mid-Year 2018

- Nearly 99 percent of Americans had access to at least one *fixed* broadband network at any speed and 91 percent had access to at least two; 97 percent of Americans had access to at least one *wired* broadband network at any speed and 86 percent had access to at least two (mid 2018 data). 99.8 percent of Americans had at least one mobile broadband network available and 98 percent had a choice of three or more LTE providers (end 2017 data).
- As expected, deployment and competition are highest at lower speeds, and in low-cost, non-rural areas.
  - Availability of fixed broadband was 97 percent at 10/1 mbps; 94 percent at 25/3 mbps; and 90 percent at 100/10 mbps. Availability of wired broadband was 95 percent at 10/1 mbps; 92 percent at 25/3; and 89 percent at 100/10 mbps.
  - Fixed broadband service from two or more providers was available to 81 percent of Americans at 10/1 mbps; 65 percent at 25/3 mbps; and 49 percent at 100/10 mbps. Wired broadband service from two or more providers was available to 72 percent of Americans at 10/1 mbps; 59 percent at 25/3 mbps; and 47 percent at 100/10 mbps.
- Deployment and competition are growing rapidly as providers upgrade networks with new technology and increased capacity. From end of 2015 to mid-2018:
  - Fiber deployment grew by 12 percentage points, increasing from 21 percent to 33 percent of homes.
  - Availability of 100/10 mbps fixed broadband increased by 24 percentage points, from 66 percent to 90 percent of homes.
  - Competitive availability of wired broadband at 25 mbps download (DL) and 3 mbps upload (UL) increased by 28 percentage points, from 31 to 59 percent of homes.
- Rural deployment is growing and the gaps between non-rural and rural deployment are declining. In rural areas, from year-end 2015 to mid-2018:
  - Availability of fixed broadband at 10/1 mbps increased by 11 percentage points from 78 percent to 89 percent; 25/3 mbps increased by 15 percentage points from 60 percent to 75 percent; 100/10 mbps increased by 30 percentage points from 31 percent to 61 percent.
  - The difference between non-rural and rural deployment of fixed broadband at 10 mbps DL and 1 mbps UL narrowed from 21 percent to 10 percent; and at 25 mbps DL and 3 mbps UL, the gap narrowed from 37 percent to 24 percent.
- Two or more wired broadband options at any speed were available to 86 percent of homes in the U.S., compared to 45 percent in Europe.
- New analysis of a 940 mbps or greater download speed tier shows that deployment of near-gigabit broadband is wider than commonly known. A comparative analysis of broadband availability based on literal gigabit speed thresholds significantly understates deployment and competition at cutting-edge speeds. As of mid-year 2018:
  - 26 percent of homes could get 1 gbps fixed broadband and 3 percent had a choice of two or more providers.
  - 67 percent could get 940 mbps fixed broadband and 20 percent had a choice of two or more providers.
  - The cable industry [says](#) it now offers “gigabit” service to more than 80 percent of homes.
- The charts and tables below provide additional details, including breakouts by technology, speed, and geography. The sources for this research include FCC Form 477 data, which some have [criticized](#) for overstating deployment, particularly in large Census Blocks in low-density rural areas. At large levels of aggregation, the degree of overstatement is proportionately inconsequential to the broader conclusions and trends described in USTelecom’s national analysis. For more detailed discussion, see USTelecom’s [July 2019 Deployment Research Brief](#).

Chart 1 – Mid-2018 Broadband Deployment Highlights

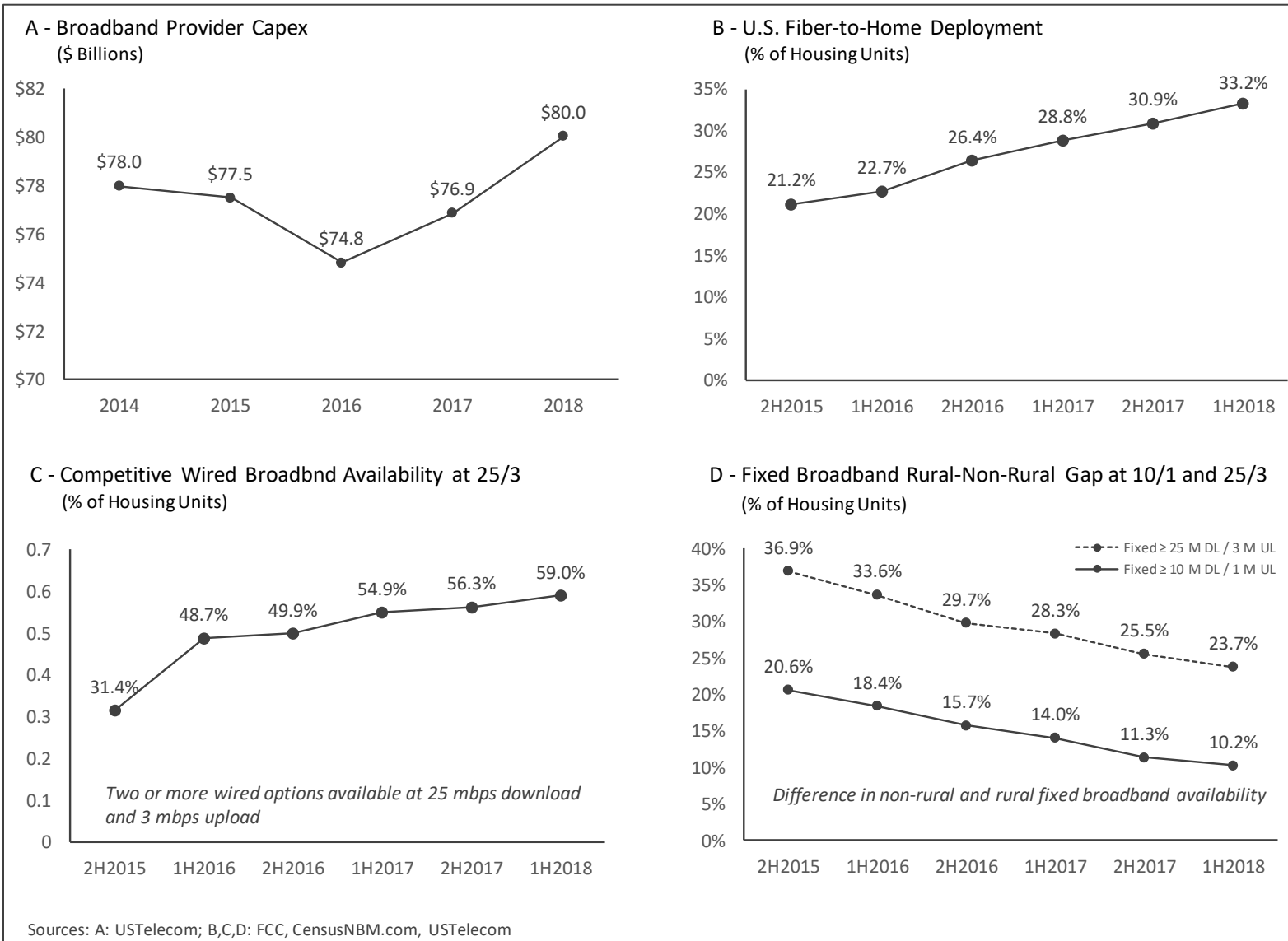
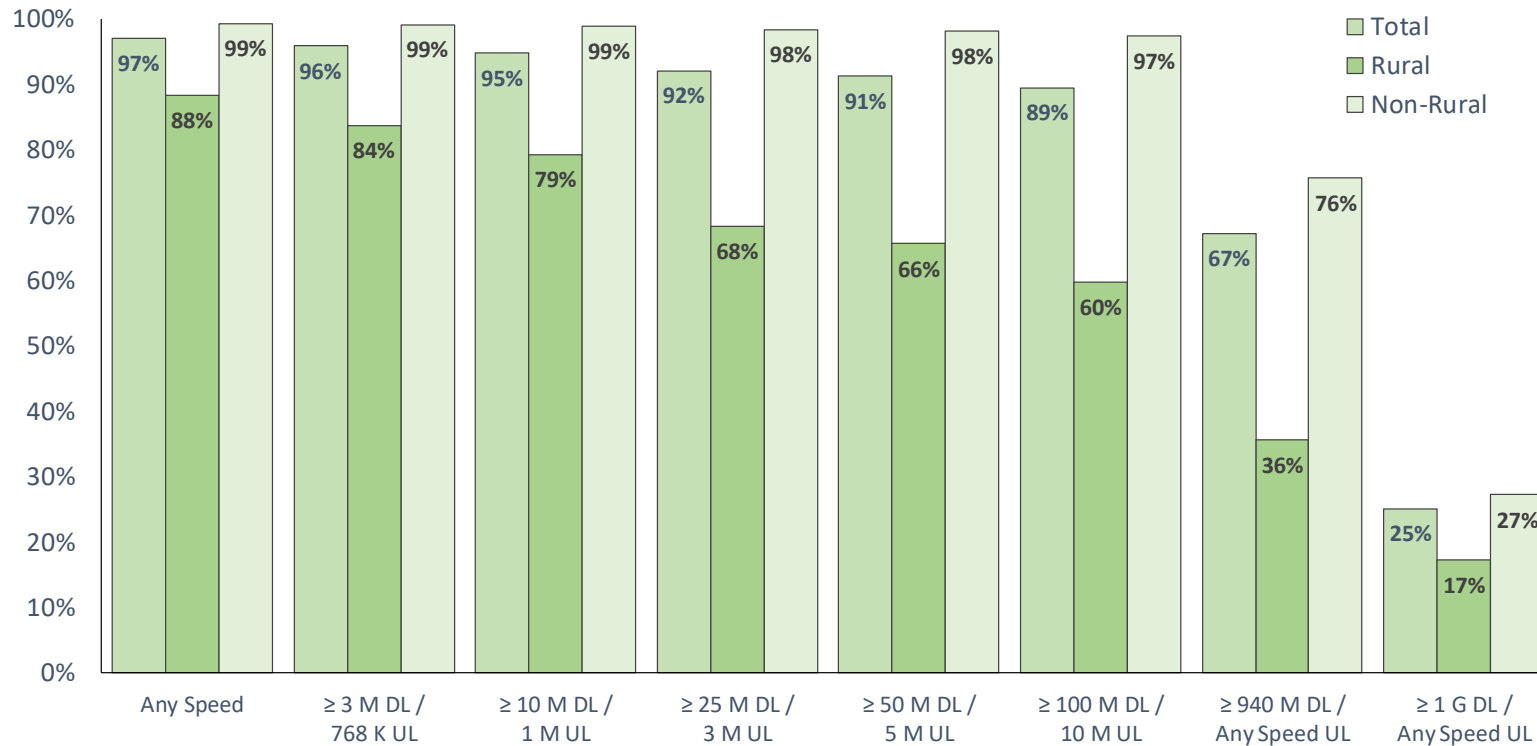


Chart 2 – U.S. Wired Broadband Availability – Total, Rural, and Non-Rural

### U.S. Wired Broadband Availability by Speed and Geographic Area, Mid-Year 2018 (Percentage of Housing Units)

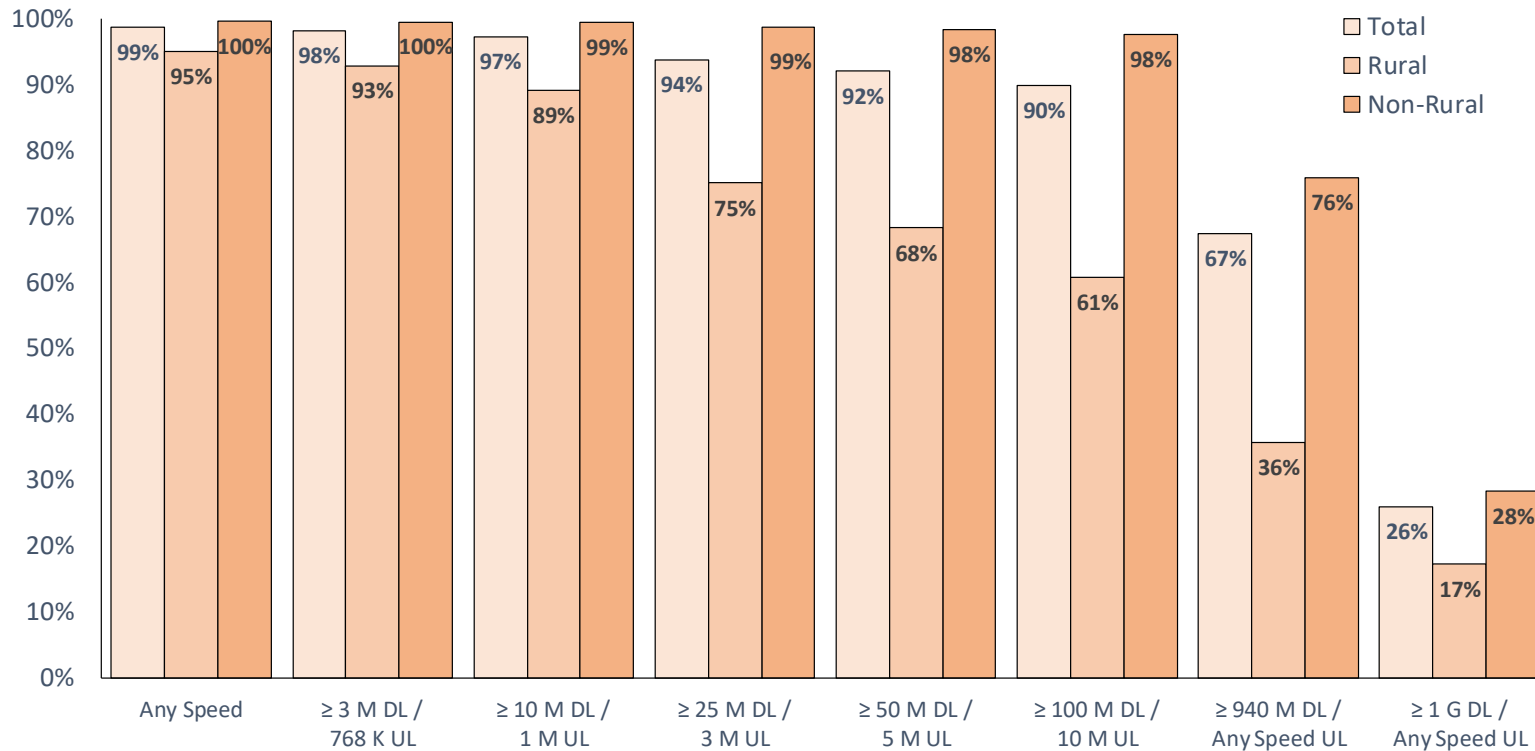


Source: FCC, USTelecom, and Telcodata CensusNBM.com

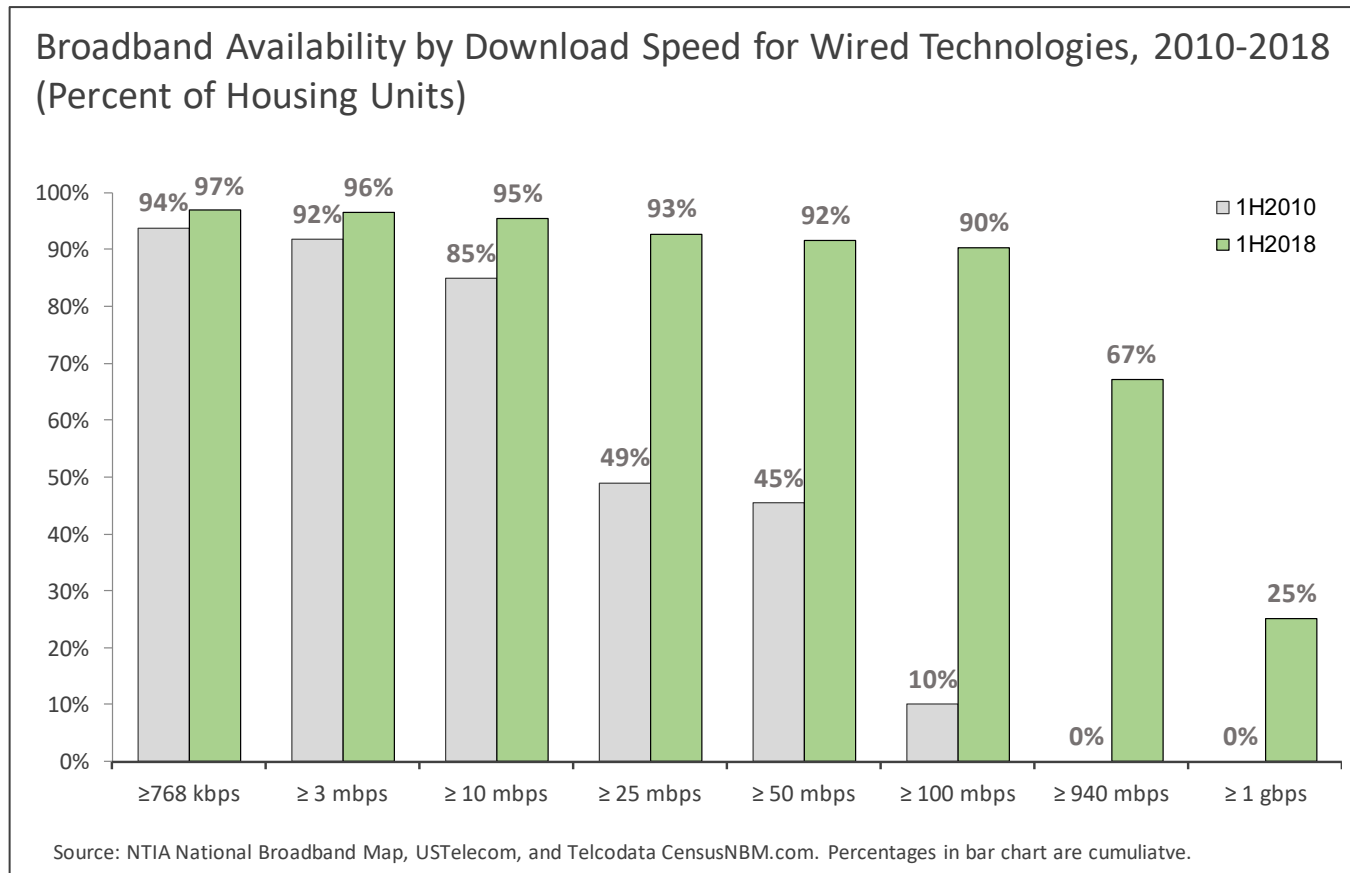


Chart 3 – U.S. Fixed Broadband Availability – Total, Rural, and Non-Rural

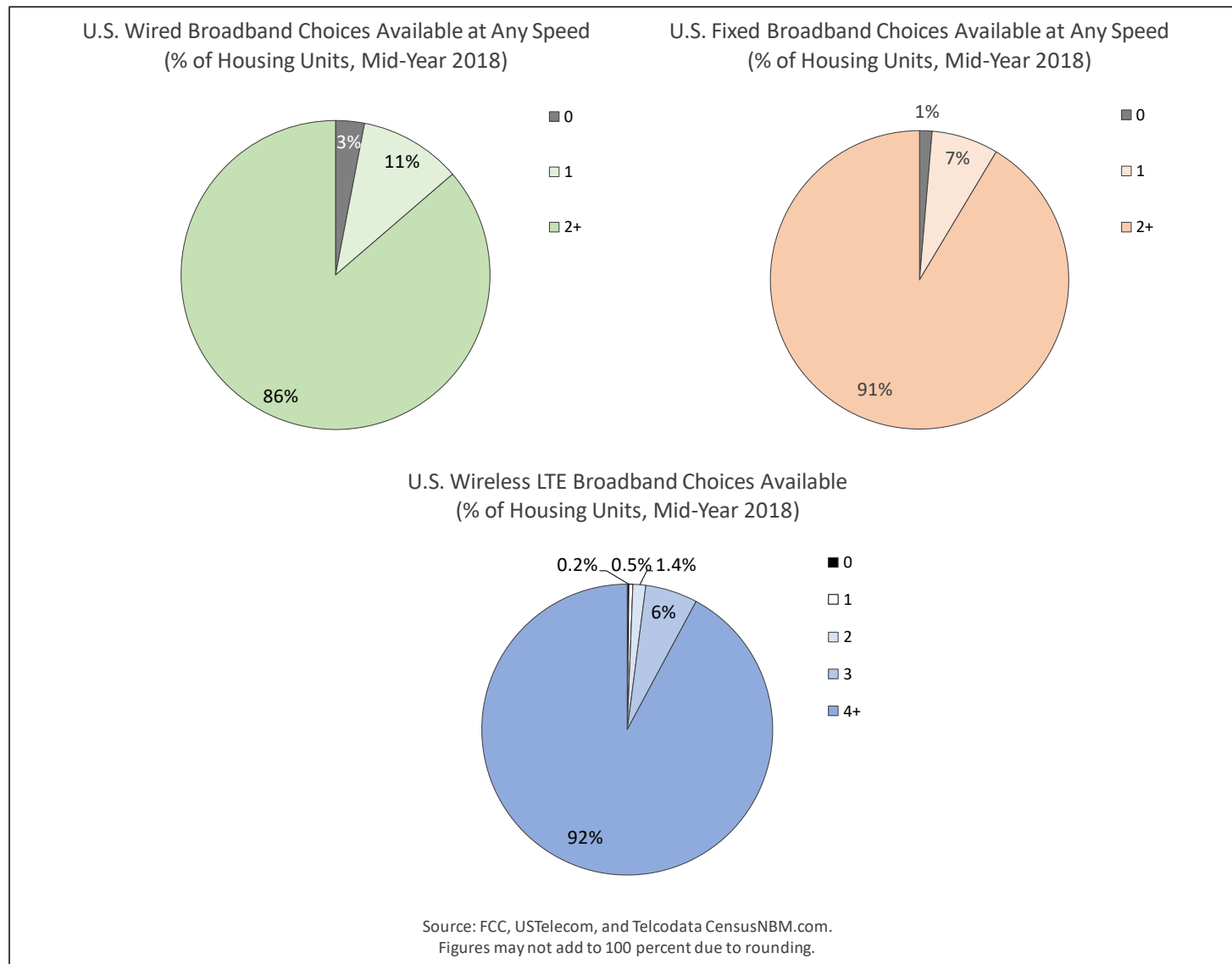
**U.S. Fixed Broadband Availability by Speed and Geographic Area, Mid-Year 2018**  
(Percentage of Housing Units)



Source: FCC, USTelecom, and Telcodata CensusNBM.com

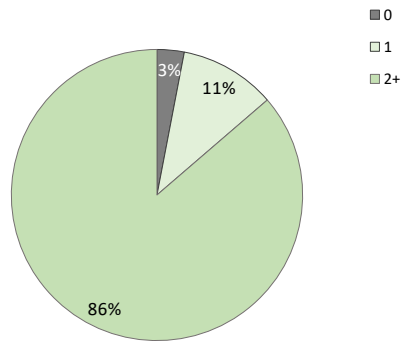
**Chart 4 – Historical U.S. Wired Broadband Availability 2010-2018**

*Note: Historical 2010 data are available for “wired” broadband and download speeds only.*

**Chart 5 – Competitive Availability of Wired, Fixed, and Mobile Broadband**

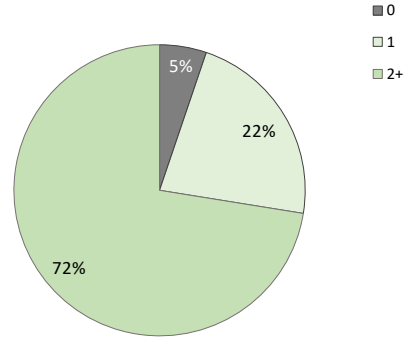
## Chart 6 – Nationwide Competitive Availability of Wired Broadband at Different Speed Tiers

U.S. Wired Broadband Choices Available at Any Speed  
(% of Housing Units, Mid-Year 2018)



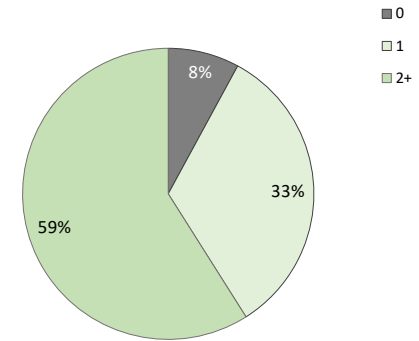
Source: FCC, USTelecom, and Telcodata CensusNBM.com.

U.S. Wired Broadband Choices Available at 10 / 1 Mbps  
(% of Housing Units, Mid-Year 2018)



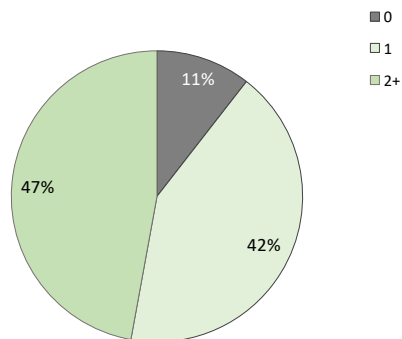
Source: FCC, USTelecom, and Telcodata CensusNBM.com.

U.S. Wired Broadband Choices Available at 25 / 3 Mbps  
(% of Housing Units, Mid-Year 2018)



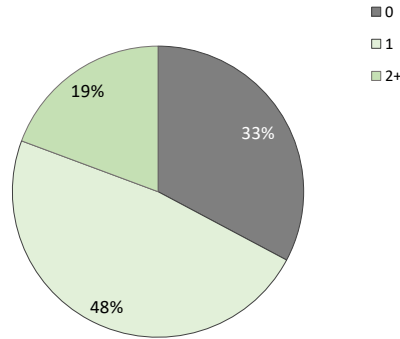
Source: FCC, USTelecom, and Telcodata CensusNBM.com.

U.S. Wired Broadband Choices Available at 100 / 10 Mbps  
(% of Housing Units, Mid-Year 2018)



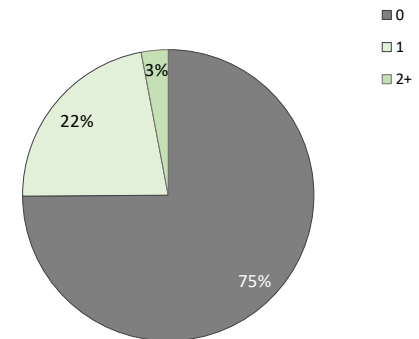
Source: FCC, USTelecom, and Telcodata CensusNBM.com.

U.S. Wired Broadband Choices Available at 940 Mbps Down  
(% of Housing Units, Mid-Year 2018)



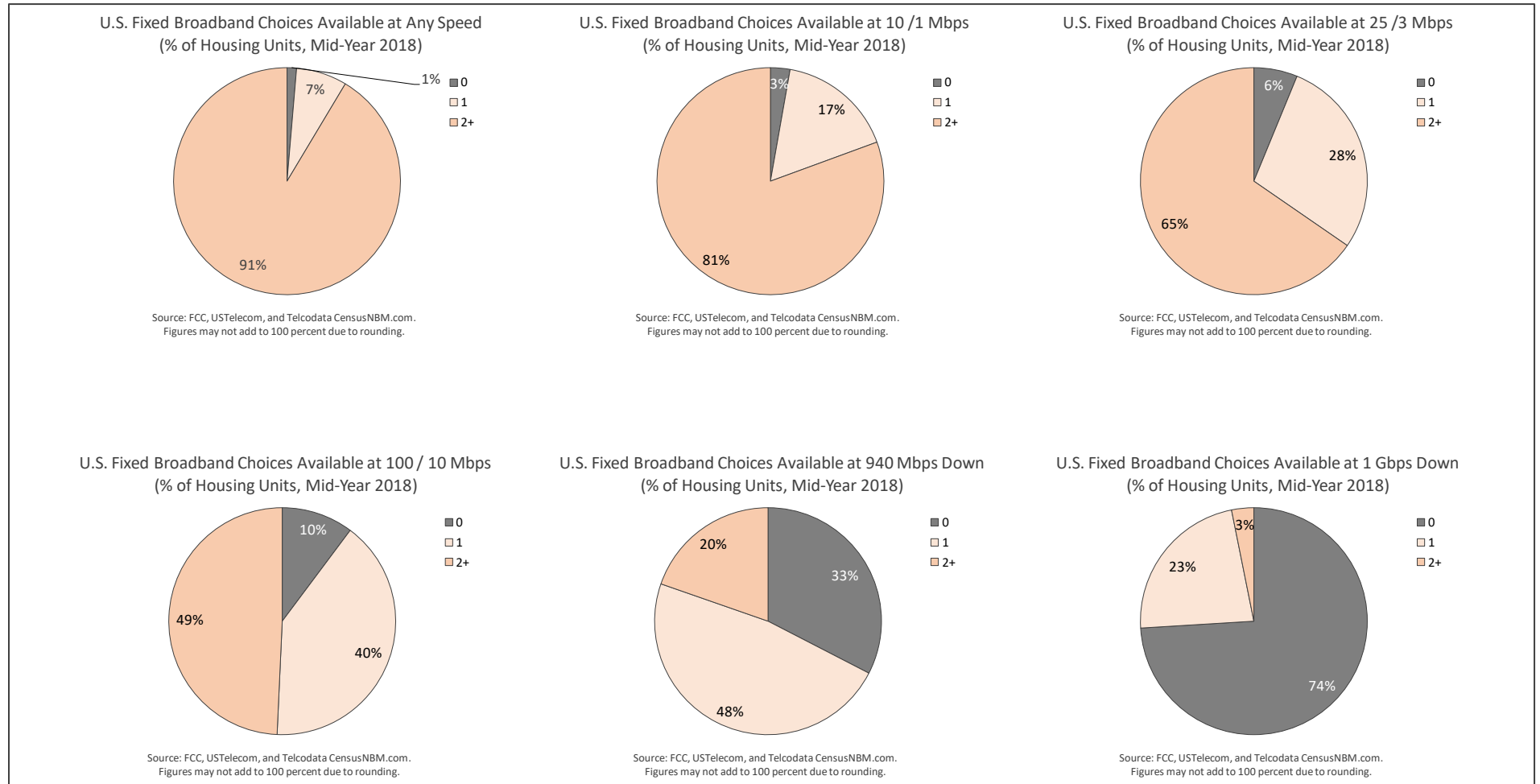
Source: FCC, USTelecom, and Telcodata CensusNBM.com.

U.S. Wired Broadband Choices Available at 1 Gbps Down  
(% of Housing Units, Mid-Year 2018)



Source: FCC, USTelecom, and Telcodata CensusNBM.com.

## Chart 7 – Nationwide Competitive Availability of Fixed Broadband at Different Speed Tiers

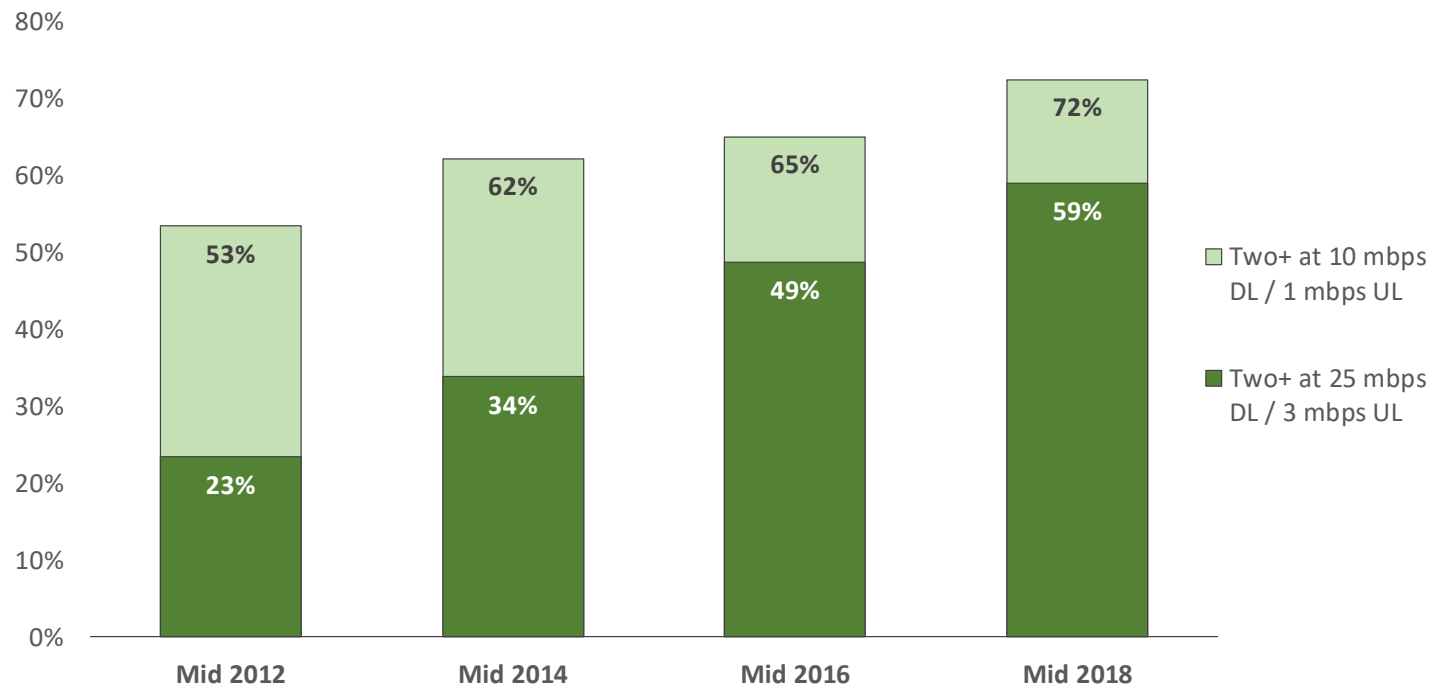


## Chart 8 – Competitive Availability of Wired Broadband at Different Speed Tiers 2012 - 2018

### U.S. Broadband Competition: Services Deployed Widely and Speeds Growing Rapidly

(% of U.S. Housing Units with Two or More Wired Broadband Options Available at Selected Speed Tiers, Mid-2012 to Mid-2018)

*Two or more wired broadband providers are available to 86 percent of Americans and at least one option is available to 97 percent. Competition occurs dynamically over time as providers upgrade network speed and quality. In addition to wired options from telecom, cable, and others, multiple satellite and wireless options are available to nearly all Americans.*



Sources: FCC, NTIA, USTelecom, and Telcodata CensusNBM.com.

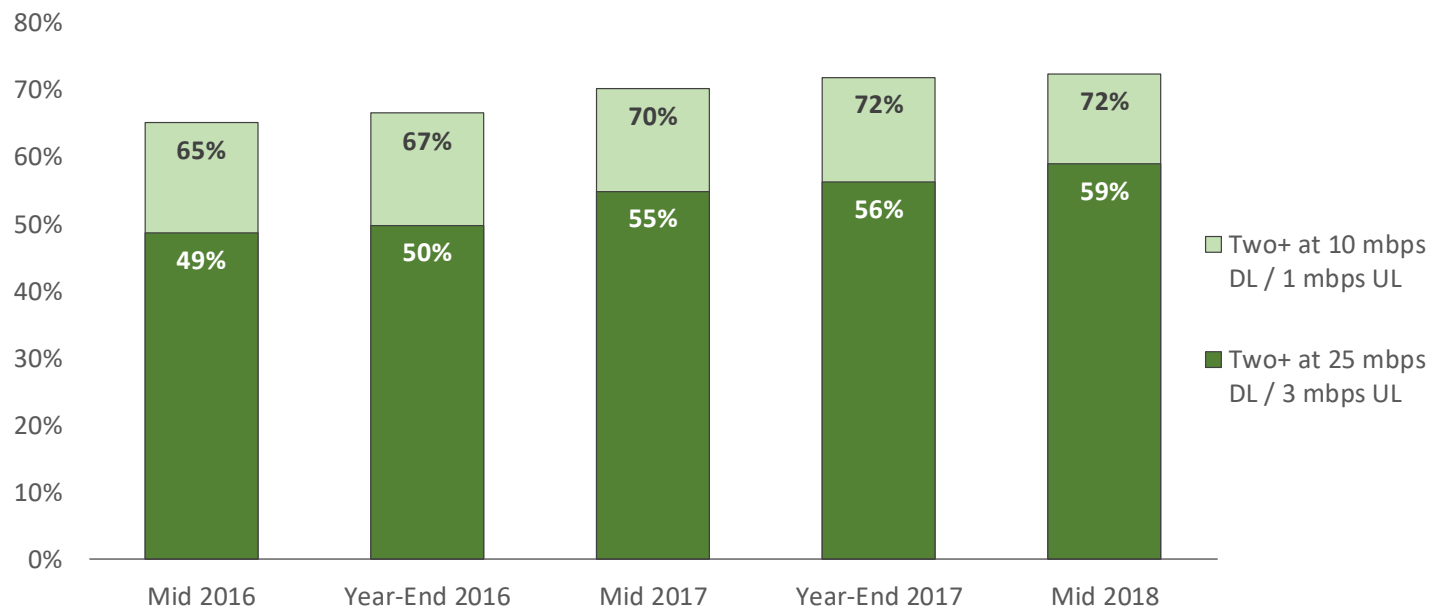
10 megabit per second download / 1 megabit per second upload estimated for 2012 and 2014 based on 10m download / 768 kilobit upload data available from NTIA. Data were adjusted proportionately according to FCC 2016 reported data for 10m DL / 1m UL and 10m DL / 768k UL.

## Chart 9 – Competitive Availability of Wired Broadband at Different Speed Tiers 2016 - 2018

### U.S. Broadband Competition: Services Deployed Widely and Speeds Growing Rapidly

(% of U.S. Housing Units with Two or More Wired Broadband Options Available at Selected Speed Tiers, Mid-2016 to Mid-2018)

*Two or more wired broadband providers are available to 86 percent of Americans and at least one option is available to 97 percent. Competition occurs dynamically over time as providers upgrade network speed and quality. In addition to wired options from telecom, cable, and others, multiple satellite and wireless options are available to nearly all Americans.*



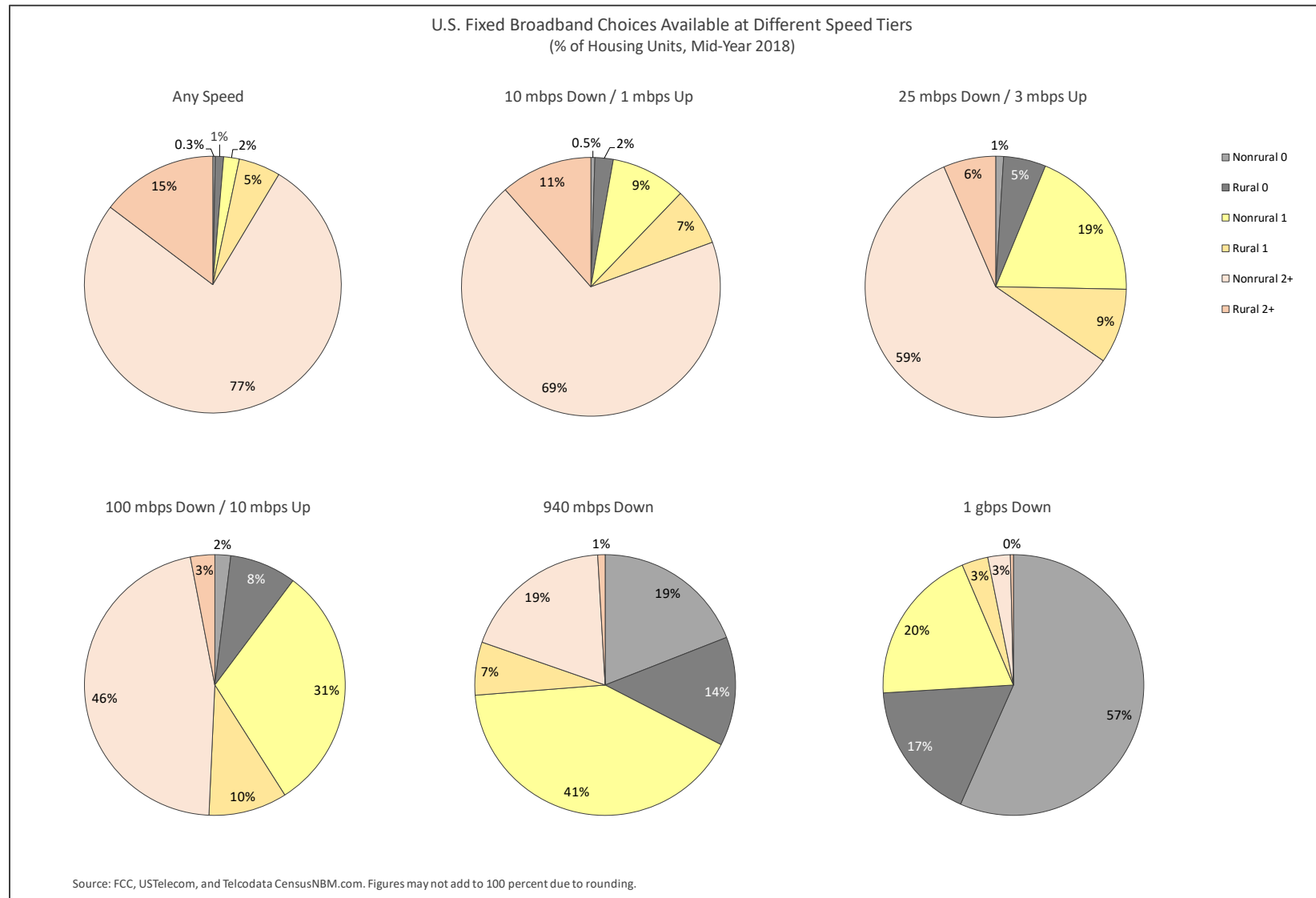
Sources: FCC, USTelecom, and Telcodata CensusNBM.com.

**Chart 10 – Competitive Availability of Wired Broadband: Total U.S. with Rural and Non-Rural Components by Speed Tier**

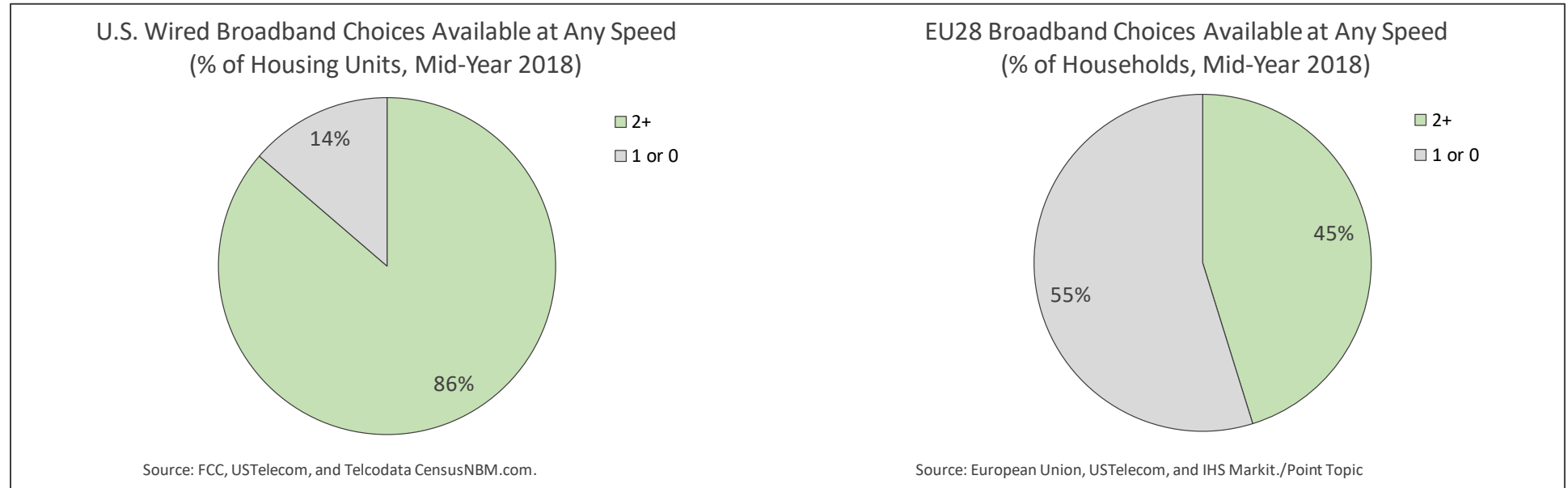




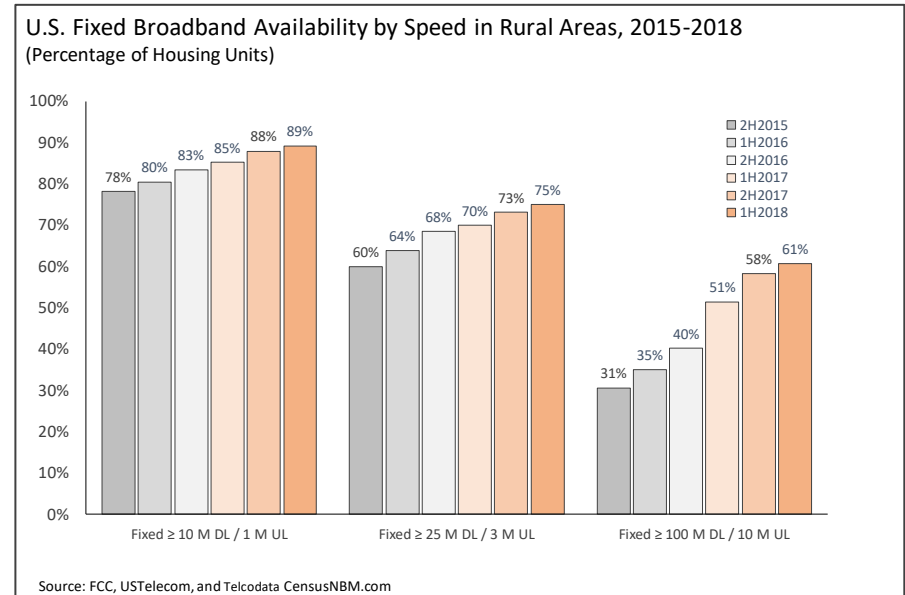
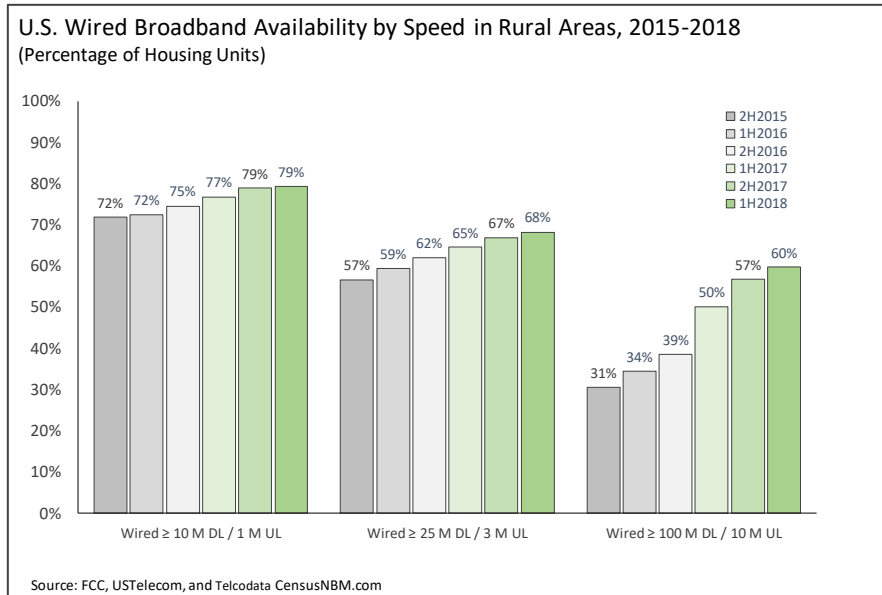
**Chart 11– Competitive Availability of Fixed Broadband: Total U.S. with Rural and Non-Rural Components by Speed Tier**



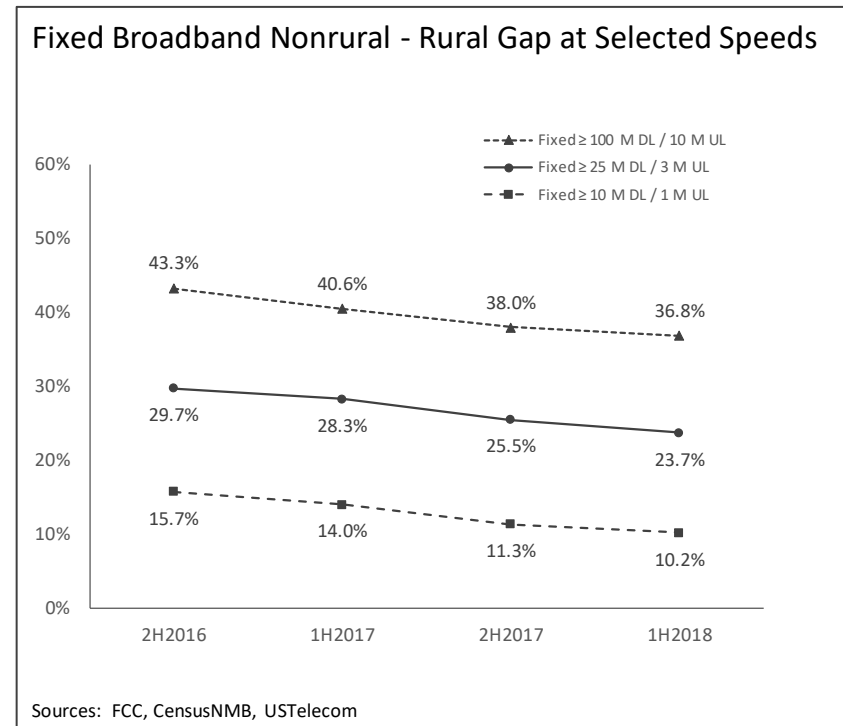
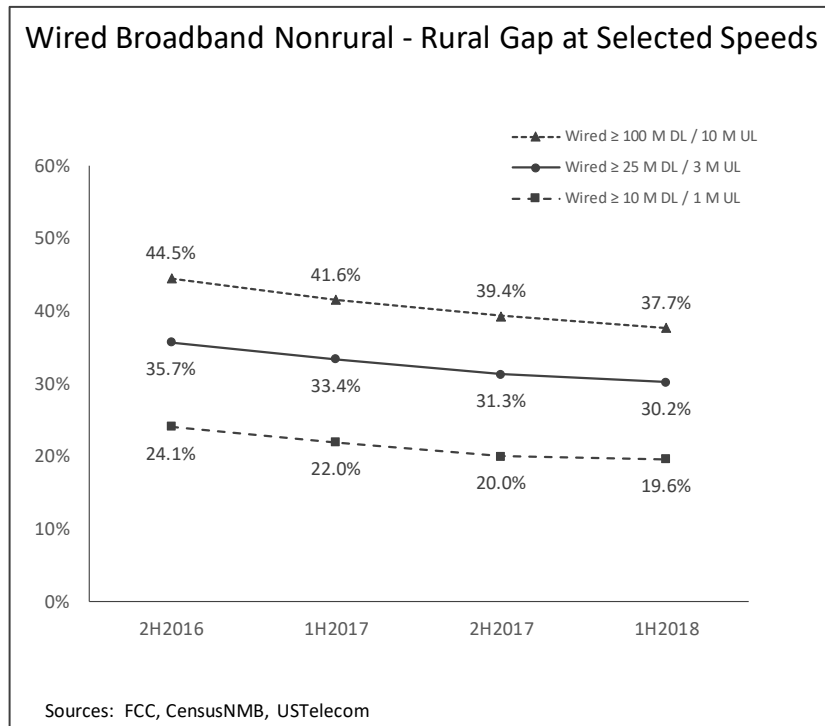
**Chart 12 – Competitive Availability United States vs. Europe**



### Chart 13 – Growing Rural Broadband Deployment at 10/1 mbps, 25/3 mbps, and 100/10 mbps



**Chart 14 – Declining Rural Broadband Deployment Gaps at 10/1 mbps, 25/3 mbps, and 100/10 mbps**



*Note: Broadband gap data for 100 /10 Mbps are not available prior to year-end 2016.*

## Appendix A – Mid-Year 2018 Broadband Availability by Housing Units for All Areas, Download and Upload

## US Broadband Availability by Technology and Speed, Mid-Year 2018, Selected Download and Upload Speeds (Percentage of Housing Units)

## All Areas

Technology	Total HU Any Speed	Total HU ≥ 3 M DL / 768 K UL	Total HU ≥ 10 M DL / 1 M UL	Total HU ≥ 25 M DL / 3 M UL	Total HU ≥ 50 M DL / 5 M UL	Total HU ≥ 100 M DL / 10 M UL	Total HU ≥ 940 M DL	Total HU ≥ 1 G DL
<b>Any Fixed Technology Except Satellite</b>	98.6%	98.1%	97.2%	93.8%	92.0%	89.8%	67.4%	26.0%
<b>Any Wired Technology</b>	97.0%	95.9%	94.8%	92.1%	91.3%	89.5%	67.2%	25.1%
<b>Any Wired Technology Except Cable</b>	93.6%	85.9%	77.3%	61.2%	58.2%	47.6%	25.8%	4.4%
<b>DSL</b>	89.7%	79.2%	65.0%	41.6%	34.7%	21.4%	0.07%	0.07%
Asymmetric xDSL	64.2%	28.8%	13.0%	3.4%	0.1%	0.1%	0.02%	0.02%
ADSL2	61.2%	53.0%	24.2%	3.7%	0.3%	0.1%	0.02%	0.02%
VDSL	44.1%	43.9%	43.2%	37.9%	34.3%	21.2%	0.03%	0.03%
Symmetric xDSL	0.7%	0.3%	0.2%	0.1%	0.1%	0.1%	0.0003%	0.0003%
<b>Copper</b>	2.6%	2.6%	2.5%	0.9%	0.7%	0.7%	0.06%	0.06%
<b>Fiber</b>	33.2%	33.2%	33.2%	32.7%	32.6%	32.1%	25.7%	17.3%
<b>Cable</b>	88.8%	88.8%	88.7%	88.3%	87.9%	87.1%	58.9%	10.3%
DOCSIS 3.1	55.7%	55.7%	55.7%	55.7%	55.7%	55.7%	55.4%	5.7%
DOCSIS 3.0	38.4%	38.4%	38.4%	38.0%	37.7%	36.6%	4.9%	4.4%
DOCSIS 1 - 1.1 - 2.0	1.1%	1.1%	1.1%	0.8%	0.2%	0.2%	0.0002%	0.0002%
Cable Other	1.4%	1.3%	1.3%	1.2%	1.1%	0.9%	0.4%	0.4%
<b>Terrestrial Fixed Wireless</b>	36.2%	35.2%	31.9%	19.5%	10.8%	6.5%	1.0%	1.0%
<b>Satellite</b>	100.00%	99.94%	99.94%	99.94%	47.59%	0.00%	0.00%	0.00%

Source: FCC, USTelecom, and Telcodata CensusNBM.com

## Appendix A – Mid-Year 2018 Broadband Availability by Housing Units for Rural Areas, Download and Upload

## US Broadband Availability by Technology and Speed, Mid-Year 2018, Download and Upload Speeds (Percentage of Housing Units)

## Rural Areas

Technology	Rural HU Any Speed	Rural HU ≥ 3 M DL / 768 K UL	Rural HU ≥ 10 M DL / 1 M UL	Rural HU ≥ 25 M DL / 3 M UL	Rural HU ≥ 50 M DL / 5 M UL	Rural HU ≥ 100 M DL / 10 M UL	Rural HU ≥ 940 M DL	Rural HU ≥ 1 G DL
<b>Any Fixed Technology Except Satellite</b>	95.0%	92.8%	89.1%	75.1%	68.2%	60.7%	35.7%	17.3%
<b>Any Wired Technology</b>	88.3%	83.7%	79.3%	68.2%	65.6%	59.7%	35.6%	17.1%
<b>Any Wired Technology Except Cable</b>	81.6%	71.4%	59.8%	34.7%	30.5%	20.3%	11.2%	10.4%
<b>DSL</b>	76.5%	64.9%	51.1%	22.1%	17.2%	6.6%	0.09%	0.09%
Asymmetric xDSL	45.0%	25.4%	7.1%	1.0%	0.3%	0.2%	0.06%	0.06%
ADSL2	52.0%	42.8%	29.8%	1.4%	0.3%	0.04%	0.01%	0.01%
VDSL	31.3%	30.7%	29.1%	20.4%	16.6%	6.3%	0.03%	0.03%
Symmetric xDSL	0.7%	0.4%	0.3%	0.2%	0.2%	0.1%	0.0002%	0.0002%
<b>Copper</b>	0.5%	0.5%	0.4%	0.0%	0.0%	0.0%	0.01%	0.01%
<b>Fiber</b>	16.9%	16.9%	16.9%	16.3%	16.0%	15.0%	11.2%	10.3%
<b>Cable</b>	55.5%	55.3%	55.1%	54.1%	53.2%	51.4%	28.1%	8.0%
DOCSIS 3.1	26.3%	26.3%	26.3%	26.3%	26.3%	26.2%	25.8%	5.7%
DOCSIS 3.0	30.7%	30.6%	30.5%	29.7%	29.0%	26.7%	2.2%	2.1%
DOCSIS 1 - 1.1 - 2.0	1.2%	1.1%	1.0%	0.5%	0.4%	0.3%	0.0001%	0.0001%
Cable Other	1.3%	1.3%	1.2%	1.1%	0.9%	0.8%	0.3%	0.3%
<b>Terrestrial Fixed Wireless</b>	41.0%	39.0%	34.4%	17.6%	6.7%	2.8%	0.1%	0.1%
<b>Satellite</b>	100.00%	99.84%	99.84%	99.84%	43.23%	0.00%	0.00%	0.00%

Source: FCC, USTelecom, and Telcodata CensusNBM.com

## Appendix A – Mid-Year 2018 Broadband Availability by Housing Units for Non-Rural Areas, Download and Upload

## US Broadband Availability by Technology and Speed, Mid-Year 2018, Download and Upload Speeds (Percentage of Housing Units)

## Non-Rural Areas

Technology	Nonrural HU Any Speed	Nonrural HU ≥ 3 M DL / 768 K UL	Nonrural HU ≥ 10 M DL / 1 M UL	Nonrural HU ≥ 25 M DL / 3 M UL	Nonrural HU ≥ 50 M DL / 5 M UL	Nonrural HU ≥ 100 M DL / 10 M UL	Nonrural HU ≥940 M DL	Nonrural HU ≥1 G DL
<b>Any Fixed Technology Except Satellite</b>	99.6%	99.5%	99.4%	98.8%	98.3%	97.5%	75.9%	28.3%
<b>Any Wired Technology</b>	99.3%	99.1%	98.9%	98.4%	98.1%	97.4%	75.6%	27.2%
<b>Any Wired Technology Except Cable</b>	96.8%	89.7%	82.0%	68.3%	65.5%	54.9%	29.7%	2.8%
<b>DSL</b>	93.2%	83.0%	68.7%	46.8%	39.4%	25.3%	0.1%	0.1%
Asymmetric xDSL	69.4%	29.8%	14.6%	4.0%	0.1%	0.04%	0.01%	0.01%
ADSL2	63.7%	55.7%	22.7%	4.2%	0.3%	0.1%	0.02%	0.02%
VDSL	47.5%	47.4%	46.9%	42.6%	39.0%	25.2%	0.03%	0.03%
Symmetric xDSL	0.7%	0.2%	0.2%	0.1%	0.0%	0.0%	0.0003%	0.0003%
<b>Copper</b>	3.1%	3.1%	3.1%	1.2%	0.9%	0.9%	0.07%	0.07%
<b>Fiber</b>	37.6%	37.6%	37.6%	37.0%	37.0%	36.7%	29.6%	19.1%
<b>Cable</b>	97.7%	97.7%	97.6%	97.4%	97.2%	96.6%	67.2%	10.9%
DOCSIS 3.1	63.5%	63.5%	63.5%	63.5%	63.5%	63.5%	63.3%	5.7%
DOCSIS 3.0	40.5%	40.5%	40.5%	40.2%	40.1%	39.2%	5.7%	5.0%
DOCSIS 1 - 1.1 - 2.0	1.1%	1.1%	1.1%	0.9%	0.2%	0.1%	0.0003%	0.0003%
Cable Other	1.4%	1.3%	1.3%	1.3%	1.1%	0.9%	0.5%	0.5%
<b>Terrestrial Fixed Wireless</b>	34.9%	34.2%	31.3%	20.0%	11.9%	7.5%	1.3%	1.3%
<b>Satellite</b>	100.00%	99.96%	99.97%	99.97%	48.74%	0.00%	0.00%	0.00%

Source: FCC, USTelecom, and Telcodata CensusNBM.com

## Appendix B Mid-Year 2018 Broadband Availability by Housing Units for All Areas, Download Only

## US Broadband Availability by Technology and Speed, Mid-Year 2018, Download Speeds Only (Percentage of Housing Units)

## All Areas

Technology	Total HU Any Speed	Total HU ≥3 M DL	Total HU ≥10 M DL	Total HU ≥25 M DL	Total HU ≥50 M DL	Total HU ≥100 M DL	Total HU ≥940 M DL	Total HU ≥1 G DL
<b>Any Fixed Technology Except Satellite</b>	98.6%	98.4%	97.5%	94.4%	92.3%	90.5%	67.4%	26.0%
<b>Any Wired Technology</b>	97.0%	96.5%	95.4%	92.7%	91.5%	90.2%	67.2%	25.1%
<b>Any Wired Technology Except Cable</b>	93.6%	89.3%	70.0%	60.4%	50.3%	48.6%	25.8%	4.4%
<b>DSL</b>	89.7%	86.8%	72.2%	45.9%	35.0%	22.4%	0.1%	0.1%
Asymmetric xDSL	64.2%	58.8%	13.3%	3.7%	0.2%	0.1%	0.02%	0.02%
ADSL2	61.2%	59.1%	53.9%	11.5%	0.4%	0.2%	0.02%	0.02%
VDSL	44.1%	43.9%	43.3%	39.7%	34.5%	22.2%	0.03%	0.03%
Symmetric xDSL	0.7%	0.3%	0.2%	0.1%	0.1%	0.1%	0.0003%	0.0003%
<b>Copper</b>	2.6%	2.6%	2.5%	0.9%	0.7%	0.7%	0.06%	0.06%
<b>Fiber</b>	33.2%	33.2%	33.2%	32.7%	32.6%	32.3%	25.7%	17.3%
<b>Cable</b>	88.8%	88.8%	88.7%	88.4%	88.2%	87.7%	58.9%	10.3%
DOCSIS 3.1	55.7%	55.7%	55.7%	55.7%	55.7%	55.7%	55.4%	5.7%
DOCSIS 3.0	38.4%	38.4%	38.4%	38.1%	37.9%	37.2%	4.9%	4.4%
DOCSIS 1 - 1.1 - 2.0	1.1%	1.1%	1.1%	0.8%	0.2%	0.2%	0.0002%	0.0002%
Cable Other	1.4%	1.3%	1.3%	1.3%	1.2%	1.2%	0.4%	0.4%
<b>Terrestrial Fixed Wireless</b>	36.2%	35.3%	31.9%	19.6%	11.0%	6.5%	1.0%	1.0%
<b>Satellite</b>	100.00%	99.94%	99.94%	99.94%	47.59%	47.59%	0.00%	0.00%

Source: FCC, USTelecom, and Telcodata CensusNBM.com



## Appendix B Mid-Year 2018 Broadband Availability by Housing Units for Rural Areas, Download Only

## US Broadband Availability by Technology and Speed, Mid-Year 2018, Download Speeds Only (Percentage of Housing Units)

## Rural Areas

Technology	Rural HU Any Speed	Rural HU ≥3 M DL	Rural HU ≥10 M DL	Rural HU ≥25 M DL	Rural HU ≥50 M DL	Rural HU ≥100 M DL	Rural HU ≥940 M DL	Rural HU ≥1 G DL
<b>Any Fixed Technology Except Satellite</b>	95.0%	93.9%	90.3%	77.5%	68.9%	63.0%	35.7%	17.3%
<b>Any Wired Technology</b>	88.3%	86.1%	81.6%	70.9%	66.2%	62.0%	35.6%	17.1%
<b>Any Wired Technology Except Cable</b>	81.6%	77.7%	65.9%	40.6%	31.0%	22.9%	11.2%	10.4%
<b>DSL</b>	76.5%	72.1%	58.0%	28.8%	17.9%	9.1%	0.1%	0.1%
Asymmetric xDSL	45.0%	38.7%	8.0%	1.3%	0.4%	0.2%	0.06%	0.06%
ADSL2	52.0%	48.8%	42.4%	10.2%	0.4%	0.2%	0.01%	0.01%
VDSL	31.3%	30.9%	29.4%	23.2%	17.2%	8.8%	0.03%	0.03%
Symmetric xDSL	0.7%	0.4%	0.3%	0.2%	0.2%	0.1%	0.0002%	0.0002%
<b>Copper</b>	0.5%	0.5%	0.4%	0.04%	0.04%	0.03%	0.01%	0.01%
<b>Fiber</b>	16.9%	16.9%	16.9%	16.3%	16.1%	15.3%	11.2%	10.3%
<b>Cable</b>	55.5%	55.4%	55.1%	54.3%	53.6%	52.5%	28.1%	8.0%
DOCSIS 3.1	26.3%	26.3%	26.3%	26.3%	26.3%	26.3%	25.8%	5.7%
DOCSIS 3.0	30.7%	30.7%	30.5%	30.0%	29.3%	27.8%	2.2%	2.1%
DOCSIS 1 - 1.1 - 2.0	1.2%	1.1%	1.0%	0.5%	0.4%	0.3%	0.0001%	0.0001%
Cable Other	1.3%	1.3%	1.2%	1.1%	1.0%	0.8%	0.3%	0.3%
<b>Terrestrial Fixed Wireless</b>	41.0%	39.4%	34.4%	17.9%	7.0%	2.9%	0.1%	0.1%
<b>Satellite</b>	100.00%	99.84%	99.84%	99.84%	43.23%	43.23%	0.00%	0.00%

Source: FCC, USTelecom, and Telcodata CensusNBM.com

## Appendix B Mid-Year 2018 Broadband Availability by Housing Units for Non-Rural Areas, Download Only

## US Broadband Availability by Technology and Speed, Mid-Year 2018, Download Speeds Only (Percentage of Housing Units)

## Nonrural Areas

Technology	Nonrural HU Any Speed	Nonrural HU ≥3 M DL	Nonrural HU ≥10 M DL	Nonrural HU ≥25 M DL	Nonrural HU ≥50 M DL	Nonrural HU ≥100 M DL	Nonrural HU ≥940 M DL	Nonrural HU ≥1 G DL
<b>Any Fixed Technology Except Satellite</b>	99.6%	99.6%	99.5%	98.9%	98.5%	97.9%	75.9%	28.3%
<b>Any Wired Technology</b>	99.3%	99.3%	99.1%	98.6%	98.3%	97.8%	75.6%	27.2%
<b>Any Wired Technology Except Cable</b>	96.8%	92.3%	71.1%	65.6%	55.5%	55.5%	29.7%	2.8%
<b>DSL</b>	93.2%	90.7%	76.0%	50.5%	39.5%	25.9%	0.1%	0.1%
Asymmetric xDSL	69.4%	64.2%	14.7%	4.3%	0.1%	0.05%	0.01%	0.01%
ADSL2	63.7%	61.9%	56.9%	11.8%	0.4%	0.2%	0.02%	0.02%
VDSL	47.5%	47.4%	47.0%	44.1%	39.1%	25.7%	0.03%	0.03%
Symmetric xDSL	0.7%	0.2%	0.2%	0.1%	0.0%	0.04%	0.0003%	0.0003%
<b>Copper</b>	3.1%	3.1%	3.1%	1.2%	0.9%	0.9%	0.07%	0.07%
<b>Fiber</b>	37.6%	37.6%	37.6%	37.0%	37.0%	36.8%	29.6%	19.1%
<b>Cable</b>	97.7%	97.7%	97.6%	97.5%	97.4%	97.0%	67.2%	10.9%
DOCSIS 3.1	63.5%	63.5%	63.5%	63.5%	63.5%	63.5%	63.3%	5.7%
DOCSIS 3.0	40.5%	40.5%	40.5%	40.3%	40.1%	39.7%	5.7%	5.0%
DOCSIS 1 - 1.1 - 2.0	1.1%	1.1%	1.1%	0.9%	0.2%	0.2%	0.0003%	0.0003%
Cable Other	1.4%	1.3%	1.3%	1.3%	1.3%	1.3%	0.5%	0.5%
<b>Terrestrial Fixed Wireless</b>	34.9%	34.2%	31.3%	20.0%	12.1%	7.5%	1.3%	1.3%
<b>Satellite</b>	100.00%	99.97%	99.97%	99.97%	48.74%	48.74%	0.00%	0.00%

Source: FCC, USTelecom, and Telcodata CensusNBM.com

## Appendix C – Methodology

### Data and Analysis

USTelecom worked with its consultant, Telcodata, to produce this research. Telcodata's broadband research service, CensusNBM (CensusNBM.com), compiled the data for this analysis by combining the FCC's broadband availability and U.S. Census housing unit data that is filed at the granular census block detail level and then consistently aggregated by Telcodata analysts to produce statistics for all 50 states plus Washington, D.C. CensusNBM uses the 2010 Census, the last period that the Bureau produced a full tabulation of housing units, households, and population. For mapping and compatibility purposes, CensusNBM computed the broadband availability and Census information at the census block level in order to produce consistent broadband availability ratios. Census housing units and households track very closely, but housing units is a broader measure: it includes occupied homes, vacant homes and vacation homes; the household measure would include only occupied housing units.

The FCC has reported broadband availability data semi-annually using data collected using its Form 477 since year-end 2014. The FCC data in this analysis are for mid-year 2018, version 1, released September 10, 2019. The FCC reports broadband availability at the census block level by provider and by technology type, with maximum download/upload speeds.

The FCC reports the following fixed technology categories based on its Form 477 data collection:

- Asymmetric xDSL
- ADSL2
- VDSL
- Symmetric xDSL
- Copper
- Fiber
- Cable DOCSIS 3.1
- Cable DOCSIS 3.0
- Cable DOCSIS 1 - 1.1 - 2.0
- Cable Other
- Terrestrial Fixed Wireless
- Satellite

To enable certain analyses at higher levels than possible with the FCC-reported technology categories, CensusNBM created several broader groupings. For example, CensusNBM created categories for all Cable technologies and all DSL technologies. It also created categories for Any Wired Technology except Cable – a category intended to include all wireline telecommunications providers; Any Wired Technology, which includes wireline telecommunications and cable providers; and Any Fixed Technology except Satellite, which combined Any Wired Technology and Terrestrial Fixed Wireless categories.

The following list represents the hierarchy of fixed broadband groupings and sub-groupings (see Appendices):

- Any Fixed Technology except Satellite
  - Any Wired Technology
    - Any Wired Technology except Cable
      - DSL
        - > Asymmetric xDSL
        - > ADSL2
        - > VDSL
        - > Symmetric xDSL
      - Copper
      - Fiber
    - Cable
      - DOCSIS 3.1
      - DOCSIS 3.0
      - DOCSIS 1 - 1.1 - 2.0
      - Cable Other
  - Terrestrial Fixed Wireless
- Satellite

The process for creating the broader categories eliminates duplication when appropriate, such as instances where a single provider reported multiple technologies in the same area, or where multiple types of providers in a broader category reported facilities in the same area. For example, since the FCC's Form 477 requires ISPs to record each broadband technology in a census block and its associated download/upload speeds, there can be duplicate records for a single provider. Therefore, when calculating the number of housing units with “Any Wired Technology except Cable” as a category, CensusNBM counts the number of housing units in census blocks where a single ISP reports both DSL and Fiber just one time – not once for fiber and once for DSL. Similarly, when calculating the number of housing units with “Any Wired Technology” as a category, CensusNBM counts the number of housing units in census blocks where both wireline telecommunications and cable operators report facilities just one time. Note that, due to methodological technicalities, the processes for estimating availability by technology and competitive overlap may produce small, insignificant differences for overall aggregated availability.

## History

The National Telecommunications and Information Administration (NTIA) collected broadband availability data semi-annually for the “National Broadband Map” from mid-2010 to mid-2014. Those data are similar to, but not the same as, the broadband availability data the FCC collects using its Form 477. As a result, it is not possible to produce precise consistent time series between the NTIA data and the FCC data; but it is possible to create some rough comparisons over time using high-level data.

As part of the National Broadband Map, NTIA produced several reports detailing results by discrete technology and speed categories. Thus far, the FCC has released a great deal of raw data and a mapping capability, and has used selected data in its Section 706 broadband deployment reports, but has not provided reports similar to those NTIA previously provided. USTelecom worked with CensusNBM to develop several reports similar to, though not identical, to the NTIA technology and speed reports. See Appendixes. In prior research briefs, USTelecom published broadband availability in the Appendixes as a percentage of housing units and as a percentage of population. Typically, the share of population is slightly greater than share of households; but the differences between share of housing units and share of population are extremely small. Therefore, publishing both housing unit and population shares adds little value. Consumers usually purchase fixed broadband service at the household level. Since the major focus of this research is on fixed broadband, USTelecom is not publishing broadband availability as a share of population.

With the FCC data, CensusNBM has flexibility to create speed tiers, technology aggregates, and other reports. It does not have as much flexibility with the NTIA data. Below is a discussion of some of the relevant differences between the NTIA and the FCC data.

- The NTIA only provided speed data in ranges, such as “1.5 mbps to 3.0 mbps.” Certain speed thresholds that have become standards, like upload speeds “greater than 1.0 mbps” are not possible to ascertain with the NTIA data. In contrast, the FCC 477 data specifies unique maximum advertised speeds, such as “1.0 mbps.” With such data points, as opposed to pre-defined ranges, it is possible for CensusNBM to create its own ranges or thresholds.
- The FCC 477 report identifies residential and business census blocks and further differentiates residential maximum advertised speeds from business/government maximum contracted speeds. Since the NTIA filings did not distinguish residential from business advertised speeds any comparison over time between the NTIA and FCC are not precisely compatible. Since the NTIA data also include business broadband deployment, earlier data will show relatively higher broadband availability results than the FCC 477 at comparable maximum advertised speeds.
- The NTIA data has only seven categories of fixed technologies, while the FCC data has 11.
- Unlike NTIA, the FCC data treats mobile wireless broadband differently than fixed broadband, so it is now not possible to report mobile data in the same manner as fixed broadband.

## Geography

These data are national (50 states plus DC) with breakouts for rural and non-rural areas based on Census classification of census blocks. In terms of housing units, approximately 79 percent are in non-rural areas and 21 percent are in rural areas.